

# Chapter 7 The school teaching environment

## Chapter outline

This chapter presents findings relating to teaching and the school environment, as reported by teachers and headteachers. The chapter firstly explores several factors related to teaching and teaching practices including: teacher training, how prepared teachers feel to teach mathematics and science, levels of career satisfaction, and the extent to which teachers collaborated in order to improve their teaching practice. The next section focuses on the school environment in terms of: the emphasis that schools placed on academic success; whether schools were perceived to be safe and orderly; discipline within the school; the impact of disruptive and uninterested pupils on teaching; and whether pupils had experienced bullying behaviours. Where relevant, England's findings for these teacher- and school-level variables are compared with those of other countries. In addition, where informative, these findings are presented alongside the average achievement in England and other participating countries.

In this chapter, themes that are common across subjects are reported together: all findings relating to Year 5 (Y5) pupils (aged 9–10) are discussed first, followed by those for Year 9 (Y9) pupils (aged 13–14). Where there are differences in the findings for mathematics and science these are highlighted.

## Key findings: teaching

- In England, almost two-thirds of Y5 pupils were taught by teachers who did not specialise in mathematics during their training. However, the vast majority of Y5 pupils were taught by teachers who feel *very well prepared* to teach the TIMSS mathematics topics.
- Fewer Y5 pupils, approximately a third, were taught by teachers who specialised in science during their training. Compared to Y5 mathematics, a smaller percentage of pupils, just over two-thirds, had teachers who feel *very well prepared* to teach the TIMSS science topics.
- In contrast to the findings for Y5, three-quarters of Y9 pupils were taught by teachers who specialised in mathematics during their training. As with Y5, almost all Y9 pupils were taught by teachers who feel *very well prepared* to teach the TIMSS mathematics topics.
- Compared with mathematics, more Y9 pupils were taught science by a science specialist. However, fewer pupils than for mathematics had teachers who feel very well prepared to teach the science TIMSS topics.
- Across participating countries, the science content domain that fewest teachers feel prepared to teach is Earth Science. In England, only 70 per cent of pupils were taught by teachers who feel *very well prepared* to teach this content domain (perhaps because some elements of Earth Science are taught through the geography curriculum in England).
- Teacher career satisfaction in England was similar to or higher than in the highest achieving countries. However, higher levels of career satisfaction did not appear to be associated with increased pupil achievement.

- More collaborative teaching practices were reported in primary schools compared with secondary schools. Nearly half of Y5 pupils were taught by teachers who had very collaborative teaching practices, whereas the equivalent proportion for Y9 pupils was approximately a quarter.

### **Key findings: school environment**

- In England, headteachers' and teachers' reports indicated a higher emphasis on academic success compared with other participating countries. This was found at both primary and secondary level for both subjects.
- In England, there was a positive association between average achievement in Y5 mathematics and science and attending a school perceived to be safe and orderly. This relationship was not seen for Y9 mathematics and science.
- Most Y5 pupils attended schools where there were hardly any perceived discipline or safety issues. This was not so for Y9 pupils: fewer than a fifth of Y9 pupils were in schools perceived to have *Hardly Any* discipline or safety issues.
- For both subjects at Y5, there was a difference in the average achievement scores between pupils whose teachers reported that their ability to teach is limited *a lot* (by disruptive or uninterested pupils) and those who reported that their teaching is limited to *some extent* or *not at all*. These differences are likely to be significant.<sup>81</sup> The same only applied to mathematics at Y9.
- Sizeable proportions of pupils (just under half at Y5 and just over two thirds at Y9) reported that they *almost never* experienced bullying behaviours. However, 20 per cent of Y5 pupils in England reported that they experienced some form of bullying behaviour *about weekly*, corresponding to the international average.

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81 Throughout this report, the term 'significant' refers to statistical significance.

## Interpreting the data: scaled data from teachers and headteachers

Most of the data presented in this chapter is reported by teachers and headteachers. Reported percentages refer to pupils and can usually (unless otherwise indicated) be interpreted as the percentage of pupils whose teacher or headteacher reported a particular practice or gave a particular response to a questionnaire item.

When interpreting the data from pupils, headteachers and teachers it is important to take account of the relative sample sizes. Participants are expected to sample a minimum of 150 schools in each year group and a minimum of 4,000 students for each target year group (these figures represent the numbers *drawn* in the sample; the *achieved* sample numbers may be less). The achieved ranges for participating schools internationally were 96 to 459 for Y5, and 95 to 501 for Y9.<sup>82</sup> These wide ranges reflected the fact that some participants had fewer than 150 schools available and some participants chose to over-sample schools. Just over half of participants sampled between 150 and 200 schools for each age group.

For TIMSS 2011 in England, the number of participating schools was 125 at Y5 and 118 at Y9. Numbers of participants within these schools were:

- 3,397 Y5 and 3,482 Y9 pupils.
- 125 and 118 headteachers respectively answered the Y5 and Y9 School Questionnaire.
- 194 Y5 class teachers completed a Teacher Questionnaire for mathematics and 199 for science.
- 213 Y9 teachers completed the Mathematics Teacher Questionnaire.
- 757 Y9 teachers completed the Science Teacher Questionnaire (the number of science teachers was greater as the Y9 pupils were sampled by mathematics class).

See Appendix A for more information about numbers of participants and sampling method.

## 7.1 Year 5 (Y5)

### 7.1.1 Teachers' major area of study during training

In order to establish the percentage of pupils taught by subject specialists, teachers were asked to indicate their main area of study and whether they had specialised in any specific subjects during their post-secondary education (the findings for teachers in England are shown in Table 7.1). In this context a 'subject specialist' is likely to have an academic qualification in the subject taught, whereas a teacher who has studied mathematics or science education may have studied the pedagogy of mathematics or science but may not have an academic qualification in the subject. It is important to recognise that this section reports the percentages of the pupils *taught* by teachers who undertook specific forms of post-secondary education (*not the percentages of teachers* who undertook specific forms of post-secondary education).

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<sup>82</sup> These figures refer to countries and exclude benchmarking participants.

**Table 7.1 Teachers' major area of study during training****Mathematics***Reported by Teachers*

Country	Major in Primary Education and Major (or Specialization) in Mathematics		Major in Primary Education but No Major (or Specialization) in Mathematics		Major in Mathematics but No Major in Primary Education		All Other Majors		No Formal Education Beyond Upper-secondary*	
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement
England	17 (3.1)	539 (8.5)	65 (4.1)	546 (5.4)	2 (0.5)	~ ~	17 (3.2)	538 (7.8)	0 (0.0)	~ ~
International Avg.	28 (0.5)	490 (1.4)	46 (0.4)	501 (1.0)	10 (0.3)	457 (3.1)	10 (0.3)	486 (2.0)	6 (0.2)	444 (3.0)

\*Countries have been increasing their certification requirements and providing professional development to teachers certified under earlier guidelines.  
 ( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.  
 A tilde (~) indicates insufficient data to report achievement.

**Science***Reported by Teachers*

Country	Major in Primary Education and Major (or Specialization) in Science		Major in Primary Education but No Major (or Specialization) in Science		Major in Science but No Major in Primary Education		All Other Majors		No Formal Education Beyond Upper-secondary*	
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement
England	25 (3.9)	534 (7.6)	50 (4.3)	526 (4.3)	7 (2.1)	555 (17.9)	17 (3.0)	520 (10.9)	1 (1.2)	~ ~
International Avg.	25 (0.4)	482 (1.5)	48 (0.4)	489 (1.3)	12 (0.3)	462 (2.4)	10 (0.3)	479 (1.9)	6 (0.2)	433 (2.9)

\*Countries have been increasing their certification requirements and providing professional development to teachers certified under earlier guidelines.  
 ( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.  
 A tilde (~) indicates insufficient data to report achievement.

Source: Exhibit 7.3, international mathematics and science reports

**Mathematics**

In England, the majority of pupils in Y5 (65 per cent) were taught mathematics by teachers whose main area of study was primary education without specialisation in mathematics. Only 17 per cent of Y5 pupils were taught mathematics by teachers who were mathematics specialists. However, in Hong Kong, Singapore and Chinese Taipei (countries with significantly higher average achievement than England), a much larger percentage of pupils aged 9-10 were taught by mathematics specialists (66 per cent, 65 per cent and 36 per cent respectively). Notably, there were some high performing countries, namely Northern Ireland and Korea, where a smaller percentage of pupils (10 per cent in each case) were taught by mathematics specialists. There was not a clear pattern within individual countries, or on average, between being taught by a subject specialist and average achievement. This was the case in both the highest performing countries such as Singapore and countries that performed similarly to England.

**Science**

In England, half of pupils in Y5 were taught science by teachers whose main area of study was primary education (without specialisation in science). Nearly a third of pupils (32 per cent) were taught science by teachers who were science specialists (7 per cent of these were taught by teachers with a specialism in science but not primary education). As was the case for mathematics, there were some high performing countries, including United States and Korea, where a smaller percentage of pupils

(less than 15 per cent) were taught by a subject specialist. However, in Singapore, Russian Federation and Chinese Taipei (also countries with a significantly higher average achievement score than England) a much larger percentage of pupils aged 9–10 were taught science by science specialists (58 per cent, 57 per cent and 49 per cent respectively). As was the case for mathematics at this level, there was not a clear association within individual countries between teacher specialisation during training and the average achievement in science at this level.

### 7.1.2 Teachers' reports of how well prepared they feel to teach mathematics and science

Teachers were also asked how prepared they feel to teach the mathematics and science content topics assessed by TIMSS (the content topics are listed in Table 7.2). For each topic, teachers had to indicate whether they feel *very well prepared*, *somewhat prepared* or *not well prepared*.

**Table 7.2 Teachers feel “very well” prepared to teach**

TIMSS mathematics topics

*Reported by Teachers*

Country	Per cent of Students Whose Teachers Feel “Very Well” Prepared to Teach TIMSS Mathematics Topics			
	Overall Mathematics (18 Topics)	Number (8 Topics)	Geometric Shapes and Measures (7 Topics)	Data Display (3 Topics)
England	90 (1.5)	91 (1.6)	89 (1.9)	93 (1.8)
International Avg.	83 (0.3)	87 (0.3)	82 (0.3)	74 (0.4)

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

TIMSS science topics

*Reported by Teachers*

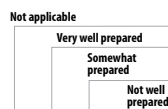
Country	Per cent of Students Whose Teachers Feel “Very Well” Prepared to Teach TIMSS Science Topics			
	Overall Science (20 Topics)	Life Science (6 Topics)	Physical Science (8 Topics)	Earth Science (6 Topics)
England	69 (2.4)	71 (3.1)	77 (2.9)	57 (2.9)
International Avg.	62 (0.3)	70 (0.4)	62 (0.4)	53 (0.4)

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

**M12**

**How well prepared do you feel you are to teach the following mathematics topics?**  
**If a topic is not in the Year 5 curriculum or you are not responsible for teaching this topic, you may tick "Not applicable."**

*Tick one circle for each row.*



**A. Number**

- a) Concepts of whole numbers, including place value and ordering .....
- b) Adding, subtracting, multiplying and/or dividing with whole numbers .....
- c) Concepts of fractions (fractions as parts of a whole or of a collection, or as a location on a number line; comparing and ordering fractions) .....
- d) Adding and subtracting with fractions .....
- e) Concepts of decimals, including place value and ordering .....
- f) Adding and subtracting with decimals .....
- g) Number sentences (finding the missing number, modelling simple situations with number sentences) .....
- h) Number patterns (extending number patterns and finding missing terms) .....

**B. Geometric Shapes and Measures**

- a) Lines: measuring, estimating length of; parallel and perpendicular lines .....
- b) Comparing and drawing angles .....
- c) Using informal coordinate systems to locate points in a plane (e.g. in square B4) .....
- d) Elementary properties of common geometric shapes .....
- e) Reflections and rotations .....
- f) Relationships between two-dimensional and three-dimensional shapes .....
- g) Finding and estimating areas, perimeters, and volumes .....

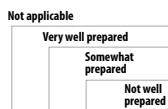
**C. Data Display**

- a) Reading data from tables, pictographs, bar graphs, or pie charts .....
- b) Drawing conclusions from data displays .....
- c) Displaying data using tables, pictographs, and bar graphs .....

**S11**

**How well prepared do you feel you are to teach the following science topics?**  
**If a topic is not in the Year 5 curriculum or you are not responsible for teaching this topic, you may tick "Not applicable."**

*Tick one circle for each row.*



**A. Life Science**

- a) Major body structures and their functions in humans and other organisms (plants and animals) .....
- b) Life cycles and reproduction in plants and animals .....
- c) Physical features, behaviour, and survival of organisms living in different environments .....
- d) Relationships in a given community (e.g. simple food chains, predator-prey relationships) .....
- e) Changes in environments (effects of human activity, pollution and its prevention) .....
- f) Human health (e.g. transmission/prevention of communicable diseases, signs of health/illness, diet, exercise) .....

**B. Physical Science**

- a) States of matter (solids, liquids, gases) and differences in their physical properties (shape, volume), including changes in state of matter by heating and cooling .....
- b) Classification of objects/materials based on physical properties (e.g. weight/mass, volume, magnetic attraction) .....
- c) Forming and separating mixtures .....
- d) Familiar changes in materials (e.g. decaying, burning, rusting, cooking) .....
- e) Common energy sources/forms and their practical uses (e.g. the Sun, electricity, water, wind) .....
- f) Light (e.g. sources, behaviour) .....
- g) Electrical circuits and properties of magnets .....
- h) Forces that cause objects to move (e.g. gravity, push/pull forces) .....

**C. Earth Science**

- a) Water on Earth (location, types, and movement) and air (composition, proof of its existence, uses) .....
- b) Common features of Earth's landscape (e.g. mountains, plains, rivers, deserts) and relationship to human use (e.g. farming, irrigation, land development) .....
- c) Weather conditions from day to day or over the seasons .....
- d) Fossils of animals and plants (age, location, formation) .....
- e) Earth's solar system (planets, Sun, moon) .....
- f) Day, night, and shadows due to Earth's rotation and its relationship to the Sun .....

Source: Exhibit 7.9 mathematics and science reports

## Mathematics

Teachers' responses about how well prepared they feel to teach the TIMSS mathematics topics were averaged across all 18 topics to give a perspective on mathematics overall as well as separately by content domain (Number, Geometric Shapes and Measures, and Data Display).

In England, 90 per cent of Y5 pupils were taught by teachers who feel *very well prepared* to teach the TIMSS mathematics topics. This compares favourably with the high performing countries where the percentage of pupils taught by teachers who feel very well prepared was similar to or lower than that in England, for example Northern Ireland (91 per cent), Singapore (89 per cent), Hong Kong (77 per cent) and Korea (73 per cent). In terms of the three mathematics content domains, there was little difference in the percentage of Y5 pupils in England whose teachers feel *very well prepared* to teach the topics within each domain (see Table 7.2). This was not the case in all participating countries. Notably, in a number of the high performing countries (e.g. Singapore, Japan and Korea) a smaller percentage of pupils were taught by teachers who feel *very well prepared* to teach Geometric Shapes and Measures and Data Display compared with Number. This may indicate that there is a greater focus on Number in the curricula of these countries, a conjecture which is borne out by data in chapter 8 of the international mathematics report.<sup>83</sup>

Compared to the mathematics topics, a lower percentage of Y5 pupils in England (69 per cent) were taught by teachers who feel *very well prepared* to teach the TIMSS science topics. However, in terms of the international picture, the percentage of pupils in England who were taught by teachers who feel *very well prepared* to teach the TIMSS science topics was higher than in a number of the highest performing countries, for example: Singapore (58 per cent), Korea (56 per cent) and Finland (51 per cent). As for the three content domains, there were big differences in the percentages of Y5 pupils in England whose teachers feel *well prepared* to teach Earth Science compared with Physical Science and Life Science (see Table 7.2). Across participating countries the domains that teachers feel *very well prepared* to teach varied. This may indicate that within these countries the focus of curricula is different (see Chapter 8 of the international report for science for more information about curricula).

### 7.1.3 Teachers' reports of collaboration to improve teaching

Teachers were asked how often they had five different types of interactions with other teachers (details of these interactions can be found below in Table 7.3). Their responses were used to create the *Collaborate to Improve Teaching* scale, which categorised the level of collaboration into three bands: *Very Collaborative*, *Collaborative* and *Somewhat Collaborative* (details of how pupils were assigned to each band is provided in Table 7.3). In England, the average scale score for mathematics was 10.5, and for science it was 10.3; both scores were within the *Collaborative* category overall.

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<sup>83</sup> See Exhibit 8.8 in the international mathematics report.

## Interpreting the data: indices and scales

In order to summarise data from a questionnaire, responses to several related items are sometimes combined to form an index or scale. The respondents to the questionnaire items are grouped according to their responses and the way in which responses have been categorised is shown for each index or scale. The data in an index or scale is often considered to be more valid and reliable than the responses to individual items.

**Table 7.3 Collaborate to improve teaching**

### Mathematics

*Reported by Teachers*

Students were scored according to their teachers' responses to how often they interacted with other teachers in each of five teaching areas on the *Collaborate to Improve Teaching* scale. Students with **Very Collaborative** teachers had a score on the scale of at least 11.0, which corresponds to their teachers having interactions with other teachers at least "one to three times per week" in each of three of the five areas and "two or three times per month" in each of the other two, on average. Students with **Somewhat Collaborative** teachers had a score no higher than 7.3, which corresponds to their teachers interacting with other teachers "never or almost never" in each of three of the five areas and "two or three times per month" in each of the other two, on average. All other students had **Collaborative** teachers.

Country	Very Collaborative		Collaborative		Somewhat Collaborative		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	47 (4.0)	541 (6.0)	44 (4.0)	550 (5.4)	9 (1.9)	538 (13.3)	10.5 (0.14)
International Avg.	36 (0.5)	493 (0.9)	53 (0.5)	491 (0.7)	11 (0.3)	488 (2.0)	

Centre point of scale set at 10.

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

### Science

*Reported by Teachers*

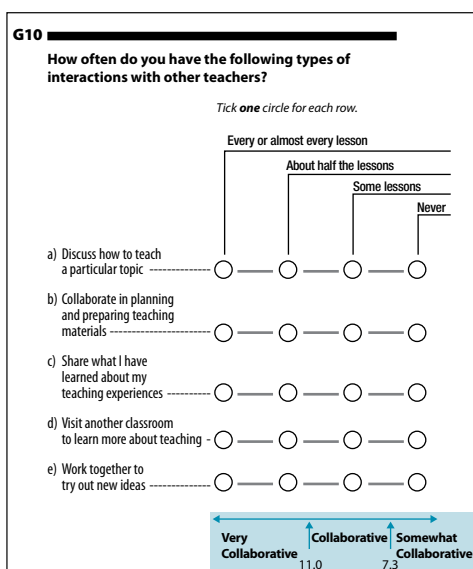
Students were scored according to their teachers' responses to how often they interacted with other teachers in each of five teaching areas on the *Collaborate to Improve Teaching* scale. Students with **Very Collaborative** teachers had a score on the scale of at least 11.0, which corresponds to their teachers having interactions with other teachers at least "one to three times per week" in each of three of the five areas and "two or three times per month" in each of the other two, on average. Students with **Somewhat Collaborative** teachers had a score no higher than 7.3, which corresponds to their teachers interacting with other teachers "never or almost never" in each of three of the five areas and "two or three times per month" in each of the other two, on average. All other students had **Collaborative** teachers.

Country	Very Collaborative		Collaborative		Somewhat Collaborative		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	42 (3.7)	523 (5.8)	47 (3.9)	534 (4.4)	11 (2.0)	537 (13.8)	10.3 (0.14)
International Avg.	35 (0.5)	487 (1.0)	53 (0.5)	487 (0.7)	12 (0.3)	479 (2.1)	

Centre point of scale set at 10.

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





Source: Exhibit 8.12, international mathematics and science reports; question adapted from the international version of the TIMSS 2011 Teacher Questionnaire<sup>84</sup>

In England, over 40 per cent of Y5 pupils were taught by teachers who had *Very Collaborative* practice. As shown in Table 7.3, the percentage for science was slightly lower than the equivalent percentage for mathematics for this age group (42 per cent and 47 per cent respectively). The majority of participants with similar average achievement to England, for mathematics and/or science, had a lower percentage of pupils taught by teachers whose practice was categorised as *Very Collaborative*. A number of countries, with significantly better performance than England at this level, also had a smaller percentage of pupils taught by teachers whose practice was in the *Very Collaborative* category. For example, in Northern Ireland only 22 per cent of pupils were taught mathematics by teachers whose practice was *Very Collaborative* and in Finland only 25 per cent of pupils had science teachers whose practice was *Very Collaborative*. However, there was not a clear association between average achievement scores for pupils in mathematics and science and the extent to which teachers reported collaboration with colleagues. The average achievement scores (both in England and internationally) were similar whether teachers' practice was categorised as *Very Collaborative*, *Collaborative* or *Somewhat Collaborative*.<sup>85</sup>

### 7.1.4 Teachers' reported career satisfaction

Teachers were asked about the degree to which they agreed with six statements about their career as a teacher (these statements can be found in Table 7.4). Their responses were used to create the *Teacher Career Satisfaction* scale, which has three bands: pupils taught by teachers who were *Satisfied*, *Somewhat Satisfied* and *Less Than Satisfied* (details of how pupils were assigned to each band is provided in Table 7.4). It is important to recognise that this section does not report the percentage of teachers who were *Satisfied*, *Somewhat Satisfied* and *Less Than Satisfied* with their careers. It reports the percentage of pupils taught by teachers who were *Satisfied*, *Somewhat Satisfied* and *Less Than Satisfied* with their careers.

<sup>84</sup> <http://timssandpirls.bc.edu/timss2011/index.html>

<sup>85</sup> Tests of statistical significance were not carried out in this international analysis. Based on the size of the standard errors, it is likely that most of the apparent differences are not statistically significant.

In England, the average scale score was 9.9 for both mathematics and science, placing England in the *Somewhat Satisfied* category of the scale overall. As this is a new scale for TIMSS 2011 there is no trend data available.

**Table 7.4 Teacher career satisfaction**

### Mathematics

*Reported by Teachers*

Students were scored according to their teachers' degree of agreement with six statements on the *Teacher Career Satisfaction* scale. Students with **Satisfied** teachers had a score on the scale of at least 10.1, which corresponds to their teachers "agreeing a lot" with three of the six statements and "agreeing a little" with the other three, on average. Students with **Less Than Satisfied** teachers had a score no higher than 6.6, which corresponds to their teachers "disagreeing a little" with three of the six statements and "agreeing a little" with the other three, on average. All other students had **Somewhat Satisfied** teachers.

Country	Satisfied		Somewhat Satisfied		Less Than Satisfied		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	53 (3.9)	549 (4.8)	36 (3.6)	543 (7.0)	11 (2.8)	527 (12.6)	9.9 (0.19)
International Avg.	54 (0.5)	494 (0.7)	41 (0.5)	487 (0.8)	5 (0.2)	486 (2.1)	

Centre point of scale set at 10.

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

### Science

*Reported by Teachers*

Students were scored according to their teachers' degree of agreement with six statements on the *Teacher Career Satisfaction* scale. Students with **Satisfied** teachers had a score on the scale of at least 10.1, which corresponds to their teachers "agreeing a lot" with three of the six statements and "agreeing a little" with the other three, on average. Students with **Less Than Satisfied** teachers had a score no higher than 6.6, which corresponds to their teachers "disagreeing a little" with three of the six statements and "agreeing a little" with the other three, on average. All other students had **Somewhat Satisfied** teachers.

Country	Satisfied		Somewhat Satisfied		Less Than Satisfied		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	52 (3.9)	534 (4.3)	37 (3.8)	531 (7.1)	11 (2.7)	507 (8.9)	9.9 (0.18)
International Avg.	54 (0.5)	490 (0.7)	41 (0.5)	483 (0.9)	5 (0.2)	483 (2.1)	

Centre point of scale set at 10.

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

**G11**

**How much do you agree with the following statements?**

Tick **one** circle for each row.

Agree a lot  
Agree a little  
Disagree a little  
Disagree a lot

a) I am content with my profession as a teacher ..... ○ — ○ — ○ — ○

b) I am satisfied with being a teacher at this school ..... ○ — ○ — ○ — ○

c) I had more enthusiasm when I began teaching than I have now\* ..... ○ — ○ — ○ — ○

d) I do important work as a teacher ..... ○ — ○ — ○ — ○

e) I plan to continue as a teacher for as long as I can ..... ○ — ○ — ○ — ○

f) I am frustrated as a teacher\* ..... ○ — ○ — ○ — ○

\*Reverse coded

Satisfied 10.1    Somewhat Satisfied 6.6    Less Than Satisfied

Source: Exhibit 7.15, international mathematics and science report; question adapted from the international version of the TIMSS 2011 Teacher Questionnaire<sup>86</sup>

86 <http://timssandpirls.bc.edu/timss2011/index.html>

Just over half of Y5 pupils in England (53 per cent for mathematics and 52 per cent for science) were taught by teachers who reported being *Satisfied* with their careers. This was very similar to the percentage in Northern Ireland (56 per cent for mathematics and 55 per cent for science). Teacher career satisfaction in the five high performing Pacific Rim countries was lower than in England for both subjects. For example, the percentage of pupils in Singapore taught by teachers who reported being *Satisfied* with their careers was 29 per cent for mathematics and 32 per cent for science. However, there were a number of countries with average achievement in the subjects similar to England's, where a greater percentage of pupils were taught by teachers who were *Satisfied* with their careers. Notably, in Denmark only 3 per cent of pupils were taught by teachers who were *Less Than Satisfied* (this was the case for mathematics and science).

Across TIMSS participants on average, mathematics and science achievement for pupils aged 9 – 10 years appeared to be slightly higher for those pupils taught by a teacher who reported being *Satisfied* with their career. In England, however, this did not appear to apply. Although the score differences for both subjects have not been tested for statistical significance, the size of the standard errors is likely to mean that the differences are not statistically significant across the three categories.

### 7.1.5 Schools' emphasis on academic success

Headteachers and teachers were asked separately to rate the emphasis placed on academic success within their school, based on their perceptions of the attitudes of teachers, parents and pupils. Emphasis on academic success was measured by responses to five statements about teachers' understanding of the school's goals, parent support and pupil expectations (the statements can be seen below Table 7.5). The international analysis used the responses to these statements to create the *School Emphasis on Academic Success* scale for each group of respondents. Pupils were categorised into three bands according to their teachers' and headteachers' responses: *Very High Emphasis*, *High Emphasis* and *Medium Emphasis* (details of how pupils were assigned to each band is provided in Table 7.5). In England, the average scale score for headteachers was 10.8 for both subjects, and for teachers it was 11.1; both scores were within the *High Emphasis* category.

It should be noted that the data provided for this scale comes from the school and teacher questionnaires and is therefore based on headteacher and teacher perceptions of the emphasis on academic success within the school. The majority of the questions were not subject specific and therefore the overall proportions were broadly the same for mathematics and science. Differences in achievement scores, however, were subject specific and have been reported separately. Table 7.5 reports the findings from headteachers' and teachers' perspectives.

**Table 7.5 School emphasis on academic success – headteacher and teacher reports**

**Mathematics**

Reported by Principals/teachers

Students were scored according to their principals'/teachers' responses characterising five aspects on the *School Emphasis on Academic Success* scale. Students in schools where their principals/teachers reported a **Very High Emphasis** on academic success had a score on the scale of at least 13.1, which corresponds to their principals/teachers characterising three of the five aspects as "very high" and the other two as "high," on average. Students in schools with a **Medium Emphasis** on academic success had a score no higher than 8.9, which corresponds to their principals/teachers characterising three of the five aspects as "medium" and the other two as "high," on average. All other students attended schools with a **High Emphasis** on academic success.

Country		Very High Emphasis						Average Scale Score
		Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	Principals	10 (2.9)	554 (6.0)	72 (4.7)	546 (4.9)	17 (3.8)	517 (9.9)	10.8 (0.18)
	Teachers	16 (3.0)	563 (7.5)	67 (4.5)	546 (4.7)	17 (3.4)	522 (9.0)	
International Avg.	Principals	8 (0.3)	511 (2.2)	58 (0.5)	496 (0.7)	34 (0.5)	477 (0.9)	11.1 (0.16)
	Teachers	7 (0.3)	503 (3.3)	60 (0.5)	496 (0.7)	33 (0.5)	477 (0.9)	

Centre point of scale set at 10.  
 ( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

**Science**

Reported by Principals/teachers

Students were scored according to their principals'/teachers' responses characterizing five aspects on the *School Emphasis on Academic Success* scale. Students in schools where their principals/teachers reported a **Very High Emphasis** on academic success had a score on the scale of at least 13.1, which corresponds to their principals characterizing three of the five aspects as "very high" and the other two as "high," on average. Students in schools with a **Medium Emphasis** on academic success had a score no higher than 8.9 (principals)/ 8.8 (teachers), which corresponds to their principals/teachers characterizing three of the five aspects as "medium" and the other two as "high," on average. All other students attended schools with a **High Emphasis** on academic success.

Country		Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
		Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	Principals	10 (2.9)	539 (7.0)	72 (4.7)	531 (4.3)	17 (3.8)	508 (8.5)	10.8 (0.18)
	Teachers	17 (2.9)	554 (8.0)	67 (4.4)	529 (4.1)	16 (3.4)	504 (7.6)	
International Avg.	Principals	8 (0.3)	508 (2.3)	58 (0.5)	492 (0.7)	34 (0.5)	471 (1.0)	11.1 (0.14)
	Teachers	8 (0.3)	499 (2.2)	60 (0.5)	492 (0.7)	33 (0.5)	472 (1.0)	

Centre point of scale set at 10.  
 ( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

**12**

**How would you characterise each of the following within your school?**

Tick **one** circle for each row.

a) Teachers' job satisfaction

b) Teachers' understanding of the school's curricular goals

c) Teachers' degree of success in implementing the school's curriculum

d) Teachers' expectations for children's achievement

e) Parental support for children's achievement

f) Parental involvement in school activities

g) Children's regard for school property

h) Children's desire to do well in school

Principals: Very High Emphasis (13.1), High Emphasis (8.9), Medium Emphasis

Teachers: Very High Emphasis (13.1), High Emphasis (8.8), Medium Emphasis

Items a, f and g did not contribute to this scale.

Source: Exhibit 6.1 and 6.3, international mathematics and science reports; question adapted from the international version of the TIMSS 2011 School and Teacher Questionnaires<sup>87</sup>

87 <http://timssandpirls.bc.edu/timss2011/index.html>  
 TIMSS 2011: mathematics and science achievement in England

In England, over 80 per cent of Y5 pupils attend schools categorised as placing a *High* or *Very High* emphasis on academic success according to the data from headteachers and class teachers.

As can be seen in Table 7.5, according to headteachers' responses, the percentage of pupils in England in the highest category of the scale was very close to the international average. However, the picture was slightly different for the teacher responses, where the percentage of pupils in the highest category of the scale in England was more than double the international average.

Based on the responses from headteachers and teachers, Northern Ireland had a high percentage of pupils in schools categorised as placing a high level of emphasis on academic success. In contrast, according to headteachers and teachers, in Singapore, Hong Kong and Japan less than 10 per cent of pupils were in this category.

The international averages indicated an association between the extent of *Emphasis on Academic Success* and average pupil achievement. That is, the higher the category of emphasis on academic success, the higher the average achievement of pupils in that category. However, in England, only the data from teachers indicated a similar trend that was likely to be significant across the three categories. The data cannot identify the direction of causality: it is not clear whether an emphasis on success causes high achievement, whether high achievement breeds a culture of success, or whether a third related variable is implicated.

### 7.1.6 Teachers' ratings of the extent to which their schools are safe and orderly

Teachers were asked about the degree to which they agreed with five statements about school safety, including the behaviour of pupils (the statements can be seen below in Table 7.6). The *Safe and Orderly School* scale was constructed based on the teachers' level of agreement with the statements. Pupils were categorised as being in schools that were: *Safe and Orderly*, *Somewhat Safe and Orderly* or *Not Safe and Orderly* (details of how pupils were assigned to each band is provided in Table 7.6). While the section reports teacher perceptions of school safety, it is important to recognise that findings are presented as the percentage of the pupils taught by these teachers. In England, the average scale score for mathematics was 10.7, and for science it was 10.8; both scores were within the *Safe and Orderly* category overall.

**Table 7.6 Safe and orderly school**

#### Mathematics

*Reported by Teachers*

Students were scored according to their teachers' degree of agreement with five statements on the **Safe and Orderly** School scale. Students in **Safe and Orderly** schools had a score on the scale of at least 10.2, which corresponds to their teachers "agreeing a lot" with three of the five qualities of a safe and orderly school and "agreeing a little" with the other two, on average. Students in **Not Safe and Orderly** schools had a score no higher than 6.3, which corresponds to their teachers "disagreeing a little" with three of the five qualities and "agreeing a little" with the other two, on average. All other students attended **Somewhat Safe and Orderly** schools.

Country	Safe and Orderly		Somewhat Safe and Orderly		Not Safe and Orderly		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	67 (4.3)	557 (3.8)	31 (4.1)	519 (7.9)	2 (1.3)	~ ~	10.7 (0.18)
International Avg.	53 (0.5)	498 (0.7)	43 (0.5)	483 (0.8)	4 (0.2)	470 (2.9)	

Centre point of scale set at 10.

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

A tilde (~) indicates insufficient data to report achievement.

## Science

Reported by Teachers

Students were scored according to their teachers' degree of agreement with five statements on the *Safe and Orderly School* scale. Students in **Safe and Orderly** schools had a score on the scale of at least 10.2, which corresponds to their teachers "agreeing a lot" with three of the five qualities of a safe and orderly school and "agreeing a little" with the other two, on average. Students in **Not Safe and Orderly** schools had a score no higher than 6.3, which corresponds to their teachers "disagreeing a little" with three of the five qualities and "agreeing a little" with the other two, on average. All other students attended **Somewhat Safe and Orderly** schools.

Country	Safe and Orderly		Somewhat Safe and Orderly		Not Safe and Orderly		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	68 (4.0)	541 (3.8)	30 (3.9)	504 (7.0)	2 (1.2)	~ ~	10.8 (0.16)
International Avg.	53 (0.5)	493 (0.7)	43 (0.5)	480 (0.9)	4 (0.2)	449 (4.0)	

Centre point of scale set at 10.

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

A tilde (~) indicates insufficient data to report achievement.

**G7**

**Thinking about your current school, indicate the extent to which you agree or disagree with each of the following statements.**

Tick **one** circle for each row.

Agree a lot  
Agree a little  
Disagree a little  
Disagree a lot

a) This school is located in a safe area ----- ○ ----- ○ ----- ○ ----- ○

b) I feel safe at this school ----- ○ ----- ○ ----- ○ ----- ○

c) This school's security policies and practices are sufficient ----- ○ ----- ○ ----- ○ ----- ○

d) The children behave in an orderly manner ----- ○ ----- ○ ----- ○ ----- ○

e) The children are respectful of the teachers ----- ○ ----- ○ ----- ○ ----- ○

← Safe and Orderly 10.7 Orderly | Somewhat safe and Orderly | Not Safe and Orderly 6.3 →

Source: Exhibit 6.7, international mathematics and science reports; question adapted from the international version of the TIMSS 2011 Teacher Questionnaire<sup>88</sup>

Table 7.6 shows that nearly 70 per cent of Y5 pupils in England were taught by teachers who judged their school to be *Safe and Orderly* (67 per cent for mathematics and 68 per cent for science). As may be expected, there was a lot of variation across countries in terms of the percentage of pupils in each of the three categories of this scale. However, of the participants that performed better than England in mathematics at this level only Northern Ireland had a higher proportion of pupils (85 per cent) taught by teachers who judged their schools as *Safe and Orderly*. This was not the case for science, where none of the countries that performed better than England had a higher proportion of pupils in schools perceived to be *Safe and Orderly* and only the benchmarking participant of Alberta in this case had a higher percentage, at 81 per cent.

In England there appeared to be an association between whether pupils attended a school that their teachers judged to be *Safe and Orderly* and their average achievement scores, as can be seen in Table 7.6. This is likely to be a significant difference for mathematics and science achievement. This corresponds to the pattern for the international averages but this relationship was not seen in all participating countries.

88 <http://timssandpirls.bc.edu/timss2011/index.html>

## 7.1.7 Teachers' ratings of the extent of school discipline and safety

This section reports headteacher perceptions of school discipline and safety. Headteachers were asked separately about the extent to which 10 discipline and safety issues were a problem in their school (these questions can be found in Table 7.7). The headteachers' responses to these questions were used to create the *School Discipline and Safety* scale. Pupils were categorised into three bands on this scale: *Hardly Any Problems*, *Minor Problems* and *Moderate Problems* (details of how pupils were assigned to each band is provided in Table 7.7). In England, the average scale score was 10.6 for mathematics and science. This score was within the *Hardly Any Problems* category overall.

**Table 7.7 School discipline and safety**

### Mathematics

*Reported by Principals*

Students were scored according to their principals' responses concerning ten potential school problems on the *School Discipline and Safety* scale. Students in schools with **Hardly Any Problems** had a score on the scale of at least 9.7, which corresponds to their principals reporting "not a problem" for five of the ten discipline and safety issues and "minor problem" for the other five, on average. Students in schools with **Moderate Problems** had a score no higher than 7.6, which corresponds to their principals reporting "moderate problem" for five of the ten issues and "minor problem" for the other five, on average. All other students attended schools with **Minor Problems**.

Country	Hardly Any Problems		Minor Problems		Moderate Problems		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	77 (4.1)	551 (4.2)	20 (4.2)	515 (11.0)	3 (1.6)	495 (10.9)	10.6 (0.11)
International Avg.	61 (0.5)	496 (0.7)	29 (0.5)	482 (1.1)	11 (0.3)	451 (2.2)	

Centre point of scale set at 10.

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

### Science

*Reported by Principals*

Students were scored according to their principals' responses concerning ten potential school problems on the *School Discipline and Safety* scale. Students in schools with **Hardly Any Problems** had a score on the scale of at least 9.7, which corresponds to their principals reporting "not a problem" for five of the ten discipline and safety issues and "minor problem" for the other five, on average. Students in schools with **Moderate Problems** had a score no higher than 7.6, which corresponds to their principals reporting "moderate problem" for five of the ten issues and "minor problem" for the other five, on average. All other students attended schools with **Minor Problems**.

Country	Hardly Any Problems		Minor Problems		Moderate Problems		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	77 (4.1)	537 (3.5)	20 (4.2)	500 (10.0)	3 (1.6)	486 (7.3)	10.6 (0.11)
International Avg.	61 (0.5)	492 (0.7)	29 (0.5)	477 (1.2)	11 (0.3)	448 (2.2)	

Centre point of scale set at 10.

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



13

A. To what degree is each of the following a problem among Year 5 children in your school?

Tick **one** circle for each row.

Not a problem      Minor problem      Moderate problem      Serious problem

a) Arriving late at school -----○-----○-----○-----○

b) Absenteeism (i.e. unjustified absences) -----○-----○-----○-----○

c) Classroom disturbance -----○-----○-----○-----○

d) Cheating -----○-----○-----○-----○

e) Swearing -----○-----○-----○-----○

f) Vandalism -----○-----○-----○-----○

g) Theft -----○-----○-----○-----○

h) Intimidation or verbal abuse among children (including texting, emailing, etc.) -----○-----○-----○-----○

i) Physical fights among children -----○-----○-----○-----○

j) Intimidation or verbal abuse of teachers or staff (including texting, emailing, etc.) -----○-----○-----○-----○

← Hardly Any Problems 9.7      Minor Problems 7.3      Moderate Problems →

Source: Exhibit 6.9, international mathematics and science reports; question adapted from the international version of the TIMSS 2011 School Questionnaire<sup>89</sup>

Levels of discipline and safety appeared to be high in England, where 77 per cent of Y5 pupils attended schools that headteachers judged to have *Hardly Any Problems*. This was above the international average of 61 per cent and only nine other participating countries had a higher percentage of pupils in this category. However, 3 per cent of Y5 pupils in England were in schools where the headteacher judged that there were *Moderate Problems* with school discipline and safety. Some of the countries that performed better than England, or had similar performance to England in mathematics and science at this level, had an even smaller percentage of pupils in this category. For example, the Netherlands, Singapore, Chinese Taipei and the Russian Federation had no pupils in the category of schools that were judged to have *Moderate Problems*.

The international averages for mathematics and science show that as schools were judged as having more problems with discipline and safety, the average achievement score decreased. Despite this, across participating countries, there did not appear to be a consistent relationship between the perceived level of discipline and safety in a school and the relative achievement of pupils across the levels. In England, for both mathematics and science, there appeared to be a difference of more than 50 scale points in achievement scores between pupils in schools perceived to have *Hardly Any Problems* and pupils in schools perceived to have *Moderate Problems*. However, only a small proportion of pupils were in the lowest category of the scale in England, which may affect the reliability of this finding. It is likely that the differences are not statistically significant across the three categories.<sup>90</sup>

89 <http://timssandpirls.bc.edu/timss2011/index.html>

90 Although the score differences have not been tested for statistical significance, the size of the standard errors suggests that the differences are unlikely to be statistically significant across the three categories.



### 7.1.8 Teachers' reports of the extent to which their teaching is limited by disruptive or uninterested pupils

Y5 teachers were asked about the extent to which disruptive or uninterested pupils limited their ability to teach the class sampled for TIMSS 2011. As shown in Table 7.8 their responses were grouped into two categories: *Some or Not At All* or *A Lot*. These questions were also included in TIMSS 2007 so we are able to examine whether the extent to which teachers in England were limited by disruptive or uninterested pupils had changed over time. However, the response categories for this item had changed since 2007 and therefore we can only reliably compare those teachers who reported that their teaching was limited a *lot*.

**Table 7.8 Teaching limited by disruptive or uninterested students**

#### Mathematics

*Reported by Teachers*

Country	Students in Classrooms Where Teachers Report Instruction Is Limited by Disruptive Students				Students in Classrooms Where Teachers Report Instruction Is Limited by Uninterested Students			
	Some or Not At All		A Lot		Some or Not At All		A Lot	
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement
England	93 (2.1)	547 (3.9)	7 (2.1)	508 (10.0)	95 (1.8)	546 (3.9)	5 (1.8)	512 (12.2)
International Avg.	87 (0.3)	493 (0.5)	13 (0.3)	479 (1.6)	89 (0.3)	494 (0.5)	11 (0.3)	468 (1.9)

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

#### Science

*Reported by Teachers*

Country	Students in Classrooms Where Teachers Report Instruction Is Limited by Disruptive Students				Students in Classrooms Where Teachers Report Instruction Is Limited by Uninterested Students			
	Some or Not At All		A Lot		Some or Not At All		A Lot	
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement
England	94 (1.9)	532 (3.6)	6 (1.9)	494 (10.2)	96 (1.7)	532 (3.5)	4 (1.7)	491 (9.6)
International Avg.	87 (0.3)	488 (0.6)	13 (0.3)	472 (1.6)	89 (0.3)	489 (0.6)	11 (0.3)	463 (1.9)

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

Source: Exhibit 8.23, international mathematics and science reports

As can be seen in Table 7.8, less than 10 per cent of Y5 pupils in England were taught by teachers who reported that their teaching is limited a *lot* by disruptive pupils (7 per cent for mathematics and 6 per cent for science). An even smaller percentage of pupils were taught by teachers who reported that their teaching is limited a *lot* by uninterested pupils for mathematics and science (5 and 4 per cent respectively). In 2007 the equivalent percentages were around 7 per cent for both disruptive pupils and uninterested pupils (for both mathematics and science). This shows that the extent to which teachers of Y5 pupils in England perceived their teaching to be limited a *lot* by disruptive or uninterested pupils in 2011 was comparable with the findings from 2007.

In 2011, across both subjects, the percentages of pupils in England taught by teachers who reported that their teaching is limited a *lot* by disruptive and uninterested pupils were lower than the international averages of 13 per cent and 11 per cent respectively. Compared with England, some of the high performing countries

had similar percentages of pupils whose teachers reported that their teaching is limited by disruptive and uninterested pupils, while in others (e.g. Korea) these percentages were larger.<sup>91</sup>

As can be seen in Table 7.8, average mathematics and science achievement in England was higher for those pupils whose teachers reported being limited *some or not at all* by disruptive pupils, compared with the achievement of those whose teachers reported being limited *a lot* (547 and 508 respectively for mathematics; 532 and 494 for science). This difference was likely to be significant for both subjects. A similar size of difference in achievement was also seen for uninterested pupils and, as was the case for disruptive pupils, the difference was likely to be significant for mathematics and science. However, this size of difference was not seen in other participating countries, on average.

### 7.1.9 Pupils' reports of bullying in school

Y5 pupils were asked how often they had experienced each of six behaviours which were considered to demonstrate bullying (this list of behaviours can be seen below Table 7.9). The international analysis used responses to these questions to create the *Students Bullied at School* scale. Pupils were categorised into three bands which described the frequency with which they had experienced the six bullying behaviours in their school during the last year: *Almost Never*, *About Monthly* and *About Weekly* (details of how pupils were categorised is provided in Table 7.9). In England, the average scale score was 9.8. This score was within the *About Monthly* category for the bullying scale overall.

**Table 7.9 Pupils bullied at school**

#### Mathematics

##### Reported by Students

Students were scored according to their responses to how often they experienced six bullying behaviors on the *Students Bullied at School* scale. Students bullied **Almost Never** had a score on the scale of at least 10.1, which corresponds to "never" experiencing three of the six bullying behaviors and each of the other three behaviors "a few times a year," on average. Students bullied **About Weekly** had a score no higher than 8.3, which corresponds to their experiencing each of three of the six behaviors "once or twice a month" and each of the other three "a few times a year," on average. All other students were bullied **About Monthly**.

Country	Almost Never		About Monthly		About Weekly		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	45 (1.3)	549 (4.2)	36 (1.0)	548 (4.5)	20 (0.8)	519 (5.3)	9.8 (0.05)
International Avg.	48 (0.2)	501 (0.5)	32 (0.1)	493 (0.6)	20 (0.1)	469 (0.7)	

Centre point of scale set at 10.

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

#### Science

##### Reported by Students

Students were scored according to their responses to how often they experienced six bullying behaviors on the *Students Bullied at School* scale. Students bullied **Almost Never** had a score on the scale of at least 10.1, which corresponds to "never" experiencing three of the six bullying behaviors and each of the other three behaviors "a few times a year," on average. Students bullied **About Weekly** had a score no higher than 8.3, which corresponds to their experiencing each of three of the six behaviors "once or twice a month" and each of the other three "a few times a year," on average. All other students were bullied **About Monthly**.

Country	Almost Never		About Monthly		About Weekly		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	45 (1.3)	537 (3.6)	36 (1.0)	533 (3.8)	20 (0.8)	505 (5.1)	9.8 (0.05)
International Avg.	48 (0.2)	497 (0.6)	32 (0.1)	489 (0.6)	20 (0.1)	464 (0.8)	

Centre point of scale set at 10.

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

91 See Exhibit 8.23 in the international science and mathematics reports.

**G9**

During this year, how often have any of the following things happened to you at school?

Tick **one** box for each row.

	At least once a week	Once or twice a month	A few times a year	Never
a) I was made fun of or called names	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) I was left out of games or activities by other children .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Someone spread lies about me .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Something was stolen from me ....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) I was hit or hurt by other children (e.g. shoving, hitting, kicking).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) I was made to do things I didn't want to do by other children.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

← Almost Never 10.1    About Monthly 8.3    About Weekly →

Source: Exhibit 6.11 international mathematics and science report; question adapted from the international version of the TIMSS 2011 Student Questionnaire<sup>92</sup>

Nearly half of Y5 pupils in England (45 per cent) were categorised as experiencing these six bullying behaviours *Almost Never*. Over half of the TIMSS participants had a higher percentage of pupils in this category. In addition, England had quite a high percentage (20 per cent) of pupils categorised as experiencing bullying behaviours *About Weekly*. Although this was the same as the international average, many countries that performed better than or similarly to England in Y5 mathematics and/or science had a smaller percentage of pupils in this category.

Pupils' reports about the frequency with which they experienced the six bullying behaviours were associated with their average mathematics and science achievement in TIMSS 2011, as indicated by the international averages. Increased bullying (as described by the categories of the *Students Bullied at School* scale) was related to a decrease in average achievement in both subjects. However, in England this association was not likely to be significant across all three categories.

As the percentage of Y5 pupils categorised as experiencing bullying behaviours *About Weekly* was higher in England than for over half of the other participants, it is important to establish if this was the case in 2007 or whether there had been an increase in the frequency of bullying reported by pupils since the last survey. However, the scale and the response categories have changed since TIMSS 2007. As a result we can only reliably compare the three statements about bullying behaviours that were unchanged since 2007 (statements a, e and f shown in Table 7.9 above). In 2007 pupils were asked whether each of the bullying behaviours had happened to them during the last month, whereas in 2011, pupils had to indicate how often each event had happened using the following response categories: *at least once a week*, *once or twice a month*, *a few times a year* or *never*. Therefore, in order to make a reasonably valid comparison over time, the percentages of pupils in the 2011 survey who responded *at least once a week* and *once or twice a month* were aggregated so that they could be compared with the percentage of pupils in the 2007 survey who reported that these bullying behaviours had happened to them during the last month. Table 7.10 shows the findings for the two surveys.

12 <http://timssandpirls.bc.edu/timss2011/index.html>

**Table 7.10 Trends in Pupils Bullied at School**

Questionnaire item	2007 percentage of pupils	2011 percentage of pupils
I was made fun of or called names	36	32
I was hit or hurt by other children (e.g. <i>shoving, hitting, kicking</i> )	43	27
I was made to do things I didn't want to do by other children	20	16

Note: standard errors are not available for this data.

Source: derived from national dataset for TIMSS 2011<sup>93</sup> and weighted almanacs for TIMSS 2007 (Foy and Olson, 2009)

As Table 7.10 shows, since the 2007 survey there was a reduction in the percentage of pupils who reported that they had experienced these specific bullying behaviours during the last month.<sup>94</sup> Notably, the percentage of pupils reporting they had been hit or hurt by other children had fallen by 16 percentage points.

## 7.2 Year 9 (Y9)

### 7.2.1 Teacher's major area of study during training

As was the case for teachers of 9-10 year olds, teachers of Y9 pupils were asked to report their main area of study and whether they had specialised in any specific subjects during their post-secondary education (the findings for teachers in England are shown in Table 7.11). As was the case for Y5, in this context a 'subject specialist' is defined as likely to have an academic qualification in the subject taught, whereas a teacher who has studied mathematics or science education may have studied the pedagogy of mathematics or science but may not have an academic qualification in the subject. It is important to recognise that this section reports the percentages of the pupils taught by teachers who undertook specific forms of post-secondary education (not the percentages of teachers who undertook specific forms of post-secondary education).

**Table 7.11 Teachers' major area of study during training**

#### Mathematics

Reported by Teachers

Country	Major in Mathematics and Mathematics Education		Major in Mathematics Education but No Major in Mathematics		Major in Mathematics but No Major in Mathematics Education		All Other Majors		No Formal Education Beyond Upper-secondary*	
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement
England	41 (3.9)	502 (10.4)	5 (1.9)	470 (25.6)	35 (4.0)	517 (7.6)	18 (2.6)	503 (13.6)	0 (0.0)	~ ~
International Avg.	32 (0.5)	471 (1.3)	12 (0.3)	470 (3.0)	41 (0.5)	468 (1.1)	12 (0.4)	462 (2.4)	3 (0.1)	418 (7.0)

\*Countries have been increasing their certification requirements and providing professional development to teachers certified under earlier guidelines.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.  
A tilde (~) indicates insufficient data to report achievement.

93 See the TIMSS 2011 international database at <http://timssandpirls.bc.edu/timss2011/index.html>

94 In the context that pupils were not asked exactly the same question. In 2011 there were additional response categories and pupils were not specifically asked about the last month. In addition, the differences have not been tested to ascertain whether or not they are statistically significant

## Science

Reported by Teachers

Country	Major in Science and Science Education		Major in Science Education but No Major in Science		Major in Science but No Major in Science Education		All Other Majors		No Formal Education Beyond Upper-secondary*	
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement
England	r 54 (3.1)	535 (6.8)	3 (0.9)	502 (17.0)	39 (3.1)	537 (6.7)	3 (1.1)	506 (16.1)	0 (0.3)	~ ~
International Avg.	28 (0.5)	480 (1.2)	11 (0.3)	470 (2.2)	51 (0.5)	478 (1.0)	8 (0.3)	476 (2.7)	2 (0.1)	~ ~

\*Countries have been increasing their certification requirements and providing professional development to teachers certified under earlier guidelines.

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

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students.

Source: Exhibit 7.4, international mathematics and science reports

## Mathematics

Forty-one per cent of Y9 pupils were taught mathematics by teachers who had a specialism in mathematics and mathematics education and a further 35 per cent were taught by teachers who had a specialism in mathematics but not mathematics education (as shown in Table 7.11). The percentage of teachers with specialisms in both mathematics and mathematics education was higher than the international average (32 per cent), and similar to some of the high performing countries, for example, Hong Kong and Japan (both at 46 per cent). There was not a clear association between a teacher specialising in mathematics during training and the average achievement of pupils, either in England<sup>95</sup> or internationally.

## Science

In England, over half of Y9 pupils (54 per cent) were taught science by teachers whose main areas of study were science and science education. A further 39 per cent of pupils were taught by teachers who had specialised in science but not science education in their training (as shown in Table 7.11). This was quite a different picture to Y5 science where less than a third of pupils (32 per cent) were taught science by teachers who were science specialists. For most of the higher performing participants in science at this level, the vast majority of pupils (over 90 per cent) were taught by teachers in the two categories of specialising in science during their training. Notably, in Finland, Massachusetts and Alberta this was not the case with only 80 per cent, 69 per cent and 56 per cent of pupils respectively taught by science specialists. As was the case with pupils aged 9-10, there was not a clear pattern within individual countries between a teacher specialisation during training and average achievement in science.<sup>96</sup>

### 7.2.2 Teacher reports of how well prepared they feel to teach mathematics and science

As for Y5, teachers of Y9 were asked how prepared they feel to teach the mathematics and science content topics assessed by TIMSS (the content topics are listed in Table 7.12). For each topic, teachers had to indicate whether they feel *Very Well Prepared*, *Somewhat Prepared* or *Not Well Prepared*.

<sup>95</sup> No tests of statistical significance were carried out in this international analysis, but the sizes of the standard errors suggest that the observed differences are unlikely to be significant across all categories.

<sup>96</sup> As was the case for mathematics, the sizes of the standard errors suggest that the observed differences in England would not be significant across all categories.

**Table 7.12 Teachers feel “very well” prepared to teach**

**TIMSS Mathematics Topics**

*Reported by Teachers*

Country	Per cent of Students Whose Teachers Feel “Very Well” Prepared to Teach TIMSS Mathematics Topics				
	Overall Mathematics (19 Topics)	Number (5 Topics)	Algebra (5 Topics)	Geometry (6 Topics)	Data and Chance (3 Topics)
England	94 (1.4)	97 (1.3)	94 (1.7)	94 (1.5)	92 (2.0)
International Avg.	84 (0.3)	92 (0.3)	87 (0.3)	85 (0.3)	62 (0.4)

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

*Reported by Teachers*

Country	Per cent of Students Whose Teachers Feel “Very Well” Prepared to Teach TIMSS Science Topics				
	Overall Science (20 Topics)	Biology (7 Topics)	Chemistry (4 Topics)	Physics (5 Topics)	Earth Science (4 Topics)
England	r 84 (1.2)	r 89 (1.5)	r 91 (1.5)	r 84 (1.8)	r 70 (2.3)
International Avg.	72 (0.3)	77 (0.4)	82 (0.4)	78 (0.4)	47 (0.5)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent. An “r” indicates data are available for at least 70% but less than 85% of the students.

**30**

**How well prepared do you feel you are to teach the following mathematics topics?**  
**If a topic is not in the key stage 3 curriculum or you are not responsible for teaching this topic, you may tick “Not applicable.”**

*Tick one circle for each row.*

Not applicable

Very well prepared

Somewhat prepared

Not well prepared

**A. Number**

a) Computing, estimating, or approximating with whole numbers .....

b) Concepts of fractions and computing with fractions .....

c) Concepts of decimals and computing with decimals .....

d) Representing, comparing, ordering, and computing with integers .....

e) Problem solving involving percentages and proportions .....

**B. Algebra**

a) Numeric, algebraic, and geometric patterns or sequences (extension, missing terms, generalisation of patterns) .....

b) Simplifying and evaluating algebraic expressions .....

c) Simple linear equations and inequalities .....

d) Simultaneous (two variables) equations .....

e) Representation of functions as ordered pairs, tables, graphs, words, or equations .....

**C. Geometry**

a) Geometric properties of angles and geometric shapes (triangles, quadrilaterals, and other common polygons) .....

b) Congruent figures and similar triangles .....

c) Relationship between three-dimensional shapes and their two-dimensional representations .....

d) Using appropriate measurement formulas for perimeters, circumferences, areas, surface areas, and volumes .....

e) Points on the Cartesian plane .....

f) Translation, reflection, and rotation .....

**D. Data and Chance**

a) Reading and displaying data using tables, pictographs, bar graphs, pie charts, and line graphs .....

b) Interpreting data sets (e.g. draw conclusions, make predictions, and estimate values between and beyond given data points) .....

c) Judging, predicting, and determining the chances of possible outcomes .....

How well prepared do you feel you are to teach the following science topics?

If a topic is not in the key stage 3 curriculum or you are not responsible for teaching this topic, you may tick "Not applicable."

Tick **one** circle for each row.

Not applicable  
Very well prepared  
Somewhat prepared  
Not well prepared

#### A. Biology

- a) Major organs and organ systems in humans and other organisms (structure/function, life processes that maintain stable bodily conditions) .....  -  -  -
- b) Cells and their functions, including respiration and photosynthesis as cellular processes .....  -  -  -
- c) Reproduction (sexual and asexual) and heredity (passing on of traits, inherited versus acquired/learned characteristics) .....  -  -  -
- d) Role of variation and adaptation in survival/extinction of species in a changing environment .....  -  -  -
- e) Interdependence of populations of organisms in an ecosystem (e.g. energy flow, food webs, competition, predation) and the impact of changes in the physical environment on populations (e.g. climate, water supply) .....  -  -  -
- f) Reasons for increase in world's human population (e.g. advances in medicine, sanitation), and the effects of population growth on the environment .....  -  -  -
- g) Human health (causes of infectious diseases, methods of infection, prevention, immunity) and the importance of diet and exercise in maintaining health .....  -  -  -

#### B. Chemistry

- a) Classification, composition, and particulate structure of matter (elements, compounds, mixtures, molecules, atoms, protons, neutrons, electrons) .....  -  -  -
- b) Solutions (solvent, solute, concentration/dilution, effect of temperature on solubility) .....  -  -  -
- c) Properties and uses of common acids and bases .....  -  -  -
- d) Chemical change (transformation of reactants, evidence of chemical change, conservation of matter, common oxidation reactions – combustion, rusting, tarnishing) .....  -  -  -

Tick **one** circle for each row.

Not applicable  
Very well prepared  
Somewhat prepared  
Not well prepared

#### C. Physics

- a) Physical states and changes in matter (explanations of properties in terms of movement and distance between particles; phase change, thermal expansion, and changes in volume and/or pressure) .....  -  -  -
- b) Energy forms, transformations, heat, and temperature .....  -  -  -
- c) Basic properties/behaviours of light (reflection, refraction, light and colour, simple ray diagrams) and sound (transmission through media, loudness, pitch, amplitude, frequency, relative speed of light and sound) .....  -  -  -
- d) Electric circuits (flow of current; types of circuits – parallel/series; current/voltage relationship) and properties and uses of permanent magnets and electromagnets .....  -  -  -
- e) Forces and motion (types of forces, basic description of motion, effects of density and pressure) .....  -  -  -

#### D. Earth Science

- a) Earth's structure and physical features (Earth's crust, mantle and core; composition and relative distribution of water, and composition of air) .....  -  -  -
- b) Earth's processes, cycles and history (rock cycle; water cycle; weather patterns; major geological events; formation of fossils and fossil fuels) .....  -  -  -
- c) Earth's resources, their use and conservation (e.g. renewable/nonrenewable resources, human use of land/soil, water resources) .....  -  -  -
- d) Earth in the solar system and the universe (phenomena on Earth – day/night, tides, phases of moon, eclipses, seasons; physical features of Earth compared to other bodies; the Sun as a star) .....  -  -  -

Source: Exhibit 7.10, international mathematics and science reports

## Mathematics

Table 7.12 shows the percentage of pupils in England taught by teachers who feel *very well prepared* to teach the topics. The responses were averaged across all 19 topics to give a perspective on mathematics overall as well as separately by content domain (Number, Algebra, Geometry and Data and Chance). The topics used to test pupils aged 13-14 were not the same as those used in the tests for 9-10 year olds so a direct comparison cannot be made with the findings for Y5 pupils.



Ninety-four per cent of Y9 pupils in England were taught by teachers who feel *very well prepared* to teach the TIMSS topics. This was a larger percentage of pupils than seen for the majority of participants with average achievement scores significantly higher than England's. Only North Carolina and Massachusetts had a higher percentage of pupils taught by teacher who feel *very well prepared* to teach the TIMSS topics (95 per cent and 97 per cent respectively).

Across participating countries a lower percentage of teachers feel *very well prepared* to teach the Data and Chance topic, compared with the other topics. For example, in Finland the percentage of pupils taught by teachers who feel *very well prepared* to teach Data and Chance was 33 per cent. The equivalent figures for Number, Algebra and Geometry were at or above 90 per cent for Finland. This, however, was not the case in England where teacher responses resulted in similar percentages across all four content domains. This may well reflect differences in the focus of the mathematics curriculum for pupils aged 13-14 across countries (see Chapter 8 of the international report<sup>97</sup> and Chapter 6 of this report for further discussion of curricula).

## Science

As was the case for mathematics, Y9 science teachers were asked how prepared they feel to teach the science content topics assessed by TIMSS (the content topics can be found below Table 7.12). Table 7.12 shows the percentage of pupils in England taught by teachers who feel *very well prepared* to teach the topics (the findings for all countries can be seen in Exhibit 7.10 in the international science report). The responses were averaged across all 20 topics to give a perspective on science overall as well as separately by content domain (Biology, Chemistry, Physics and Earth Science).

In England, 84 per cent of students were taught by teachers who feel *very well prepared* to teach the TIMSS science topics. This was higher than the equivalent percentage for pupils aged 9 -10, where only 69 per cent of pupils were taught by teachers who feel *very well prepared* to teach the TIMSS science topics. This may well reflect the fact that fewer pupils in the younger age group were taught by teachers who had specialised in science during their training. In addition, when compared with the majority of high achieving participants, there was a higher percentage of Y9 pupils in England with teachers who feel *very well prepared* to teach the TIMSS science topics. In terms of the four content domains there was a big difference in the percentage of Y9 pupils in England whose teachers feel *very well prepared* to teach Earth Science compared with Biology, Chemistry and Physics (shown in Table 7.12). This mirrors the findings for Earth Science at Y5. This pattern was also reflected in the findings for the majority of participants, with Earth Science the TIMSS content domain in which fewest pupils were taught by teachers who feel well prepared to teach it.<sup>98</sup>

### 7.2.3 Teachers' reports of collaboration to improve teaching in each subject

Teachers were asked how often they engaged in a number of collaborative teaching practices. These were the same statements given to the Y5 teachers (the collaborative practices and details of how pupils were assigned to each band of the *Collaborate to Improve Learning* scale are detailed below in Table 7.13). For Y9 there was a separate questionnaire for mathematics teachers and science teachers and, therefore, there may be more variation in the responses for each subject compared with the findings for Y5. While this section is based on teacher reports of the extent to

97 See Exhibit 8.9 in the international mathematics report.

98 This may be because the Earth Science topics would be covered in the geography curriculum and therefore science teachers would not be responsible for teaching these.



which they collaborate with colleagues, it is important to recognise that findings are presented as the percentage of the pupils taught by these teachers. In England, the average scale score for mathematics was 9.7, and for science it was 9.9; both scores were within the *Collaborative* category overall.

**Table 7.13 Collaborate to improve teaching**

**Mathematics**

*Reported by Teachers*

Students were scored according to their teachers' responses to how often they interacted with other teachers in each of five teaching areas on the *Collaborate to Improve Teaching* scale. Students with **Very Collaborative** teachers had a score on the scale of at least 11.4, which corresponds to their teachers having interactions with other teachers at least "one to three times per week" in each of three of the five areas and "two or three times per month" in each of the other two, on average. Students with **Somewhat Collaborative** teachers had a score no higher than 7.5, which corresponds to their teachers interacting with other teachers "never or almost never" in each of three of the five areas and "two or three times per month" in the other two, on average. All other students had **Collaborative** teachers.

Country	Very Collaborative		Collaborative		Somewhat Collaborative		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	24 (3.8)	502 (12.4)	57 (4.2)	505 (7.9)	20 (3.1)	512 (16.5)	9.7 (0.15)
International Avg.	28 (0.5)	467 (1.2)	57 (0.6)	468 (0.8)	15 (0.4)	465 (1.9)	

**Science**

*Reported by Teachers*

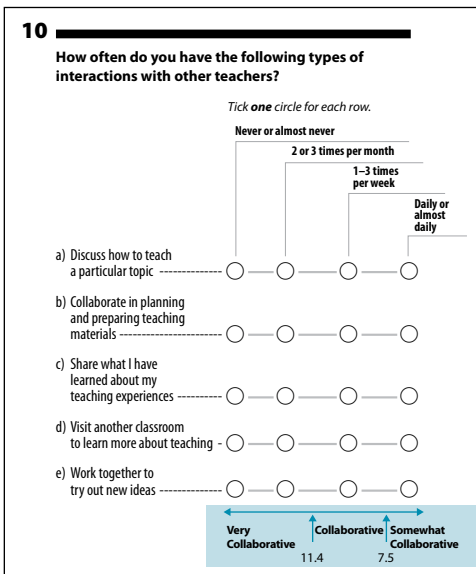
Students were scored according to their teachers' responses to how often they interacted with other teachers in each of five teaching areas on the *Collaborate to Improve Teaching* scale. Students with **Very Collaborative** teachers had a score on the scale of at least 11.4, which corresponds to their teachers having interactions with other teachers at least "one to three times per week" in each of three of the five areas and "two or three times per month" in each of the other two, on average. Students with **Somewhat Collaborative** teachers had a score no higher than 7.5, which corresponds to their teachers interacting with other teachers "never or almost never" in each of three of the five areas and "two or three times per month" in each of the other two, on average. All other students had **Collaborative** teachers.

Country	Very Collaborative		Collaborative		Somewhat Collaborative		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	27 (3.4)	521 (12.6)	57 (3.0)	536 (5.7)	16 (2.6)	535 (8.2)	9.9 (0.16)
International Avg.	29 (0.5)	476 (1.1)	58 (0.5)	479 (0.8)	13 (0.4)	472 (2.1)	

Centre point of scale set at 10.

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

An "r" indicates data are available for at least 70% but less than 85% of the students.



Source: Exhibit 8.13, international mathematics and science reports; question adapted from the international version of the TIMSS 2011 Mathematics and Science Teacher Questionnaires<sup>99</sup>

99 <http://timssandpirls.bc.edu/timss2011/index.html>.

In contrast to the findings for Y5 mathematics and science, a smaller percentage of Y9 pupils were taught by teachers classified as having *Very Collaborative* practice (24 per cent for mathematics and 27 per cent for science). However, a number of countries, with significantly better performance than England in mathematics at this level, had an even smaller percentage of pupils in this category. For example, in Singapore, Chinese Taipei, Japan, Hong Kong and Korea the percentages of pupils taught by teachers whose practice was categorised as *Very Collaborative* were between 11 and 17 per cent inclusive for mathematics.

For the majority of countries, most pupils were taught by teachers whose practice was categorised as *Collaborative*. In England, for both subjects, this accounted for 57 per cent of Y9 pupils. As was seen in the Y5 findings, the average achievement scores for Y9 pupils in England and internationally were relatively similar regardless of levels of collaborative practice.<sup>100</sup> The differences observed for Y9 mathematics and science in England are unlikely to be significant.

## 7.2.4 Teachers' reported career satisfaction

Teachers of pupils in Y9 responded to six statements about their career as a teacher. These were the same statements used for the Y5 teachers (these statements can be found in Table 7.14). Their responses were used to create the *Teacher Career Satisfaction* scale.

In England, the average scale score for mathematics was 10.1, and for science it was 9.5; both scores were within the *Somewhat Satisfied* category of the *Teacher Career Satisfaction* scale overall. This is a new scale for TIMSS 2011 and therefore no trend data is available (details of how the scale is created can be found in Table 7.14).

**Table 7.14 Teacher career satisfaction**

### Mathematics

*Reported by Teachers*

Students were scored according to their teachers' degree of agreement with six statements on the *Teacher Career Satisfaction* scale. Students with **Satisfied** teachers had a score on the scale of at least 10.4, which corresponds to their teachers "agreeing a lot" with three of the six statements and "agreeing a little" with the other three, on average. Students with **Less Than Satisfied** teachers had a score no higher than 7.0, which corresponds to their teachers "disagreeing a little" with three of the six statements and "agreeing a little" with the other three, on average. All other students had **Somewhat Satisfied** teachers.

Country	Satisfied		Somewhat Satisfied		Less Than Satisfied		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	46 (4.0)	513 (8.0)	44 (3.9)	507 (9.1)	10 (2.8)	466 (20.3)	10.1 (0.19)
International Avg.	47 (0.6)	473 (0.9)	45 (0.6)	464 (1.0)	7 (0.3)	462 (2.4)	

### Science

*Reported by Teachers*

Students were scored according to their teachers' degree of agreement with six statements on the *Teacher Career Satisfaction* scale. Students with **Satisfied** teachers had a score on the scale of at least 10.4, which corresponds to their teachers "agreeing a lot" with three of the six statements and "agreeing a little" with the other three, on average. Students with **Less Than Satisfied** teachers had a score no higher than 7.0, which corresponds to their teachers "disagreeing a little" with three of the six statements and "agreeing a little" with the other three, on average. All other students had **Somewhat Satisfied** teachers.

Country	Satisfied		Somewhat Satisfied		Less Than Satisfied		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	39 (2.8)	526 (8.6)	46 (3.1)	533 (6.7)	15 (2.4)	542 (8.4)	9.5 (0.13)
International Avg.	47 (0.5)	481 (0.8)	45 (0.5)	474 (0.8)	8 (0.3)	473 (2.3)	

Centre point of scale set at 10.

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

<sup>100</sup> Tests of statistical significance were not carried out in this international analysis but, based on the size of the standard errors, it is unlikely that the apparent differences are statistically significant.

**11** **How much do you agree with the following statements?**

Tick **one** circle for each row.

Agree a lot  
Agree a little  
Disagree a little  
Disagree a lot

a) I am content with my profession as a teacher ..... ○ — ○ — ○ — ○

b) I am satisfied with being a teacher at this school ..... ○ — ○ — ○ — ○

c) I had more enthusiasm when I began teaching than I have now\* ..... ○ — ○ — ○ — ○

d) I do important work as a teacher ..... ○ — ○ — ○ — ○

e) I plan to continue as a teacher for as long as I can --- ○ — ○ — ○ — ○

f) I am frustrated as a teacher\* --- ○ — ○ — ○ — ○

\*Reverse Coded

Satisfied 10.1    Somewhat Satisfied 7.0    Less Than Satisfied

Source: Exhibit 7.16, international mathematics report and Exhibit 715 international science report; question adapted from the international version of the TIMSS 2011 Mathematics and Science Teacher Questionnaires<sup>101</sup>

In England, there was a difference between the responses of teachers of Y9 mathematics and science. Forty-six per cent of Y9 pupils were taught by mathematics teachers who reported being *Satisfied* with their careers. The equivalent percentage for science was 39 per cent. Although this was lower than in a number of other participating countries, it compared favourably with levels of teacher satisfaction in the highest performing countries in mathematics and science: notably, the percentage of pupils in England whose teachers were *Satisfied* with their careers was higher than in Singapore, Chinese Taipei and Korea for both subjects.

For mathematics and science at this level, the international averages appeared to show higher pupil achievement for those pupils taught by teachers who reported being more satisfied with their careers, but the observed differences were unlikely to be significant. The comparative data for England showed apparent differences that were also unlikely to be significant.

### 7.2.5 Schools' emphasis on academic success

As with Y5, headteachers and teachers were asked about teachers' understanding of the school's goals, based on their perceptions of the attitudes of teachers, parents and pupils (the statements can be seen in Table 7.15). The responses to these statements were used to create a scale for measuring the emphasis on academic success in the school (the way in which responses were categorised on the scale is detailed in Table 7.15). In England, the average scale score for headteachers was 11.6 for both subjects, and for teachers it was 11.2 for mathematics and 11.1 for science. All three scores were within the *High Emphasis* category overall.

While this section reports headteacher and teacher perceptions of their schools' emphasis on academic success, it is important to recognise that findings are presented as the percentage of the TIMSS pupils who attend these schools. As with Y5, the majority of the questions were not subject specific and therefore the overall proportions were broadly the same for mathematics and science. Differences in achievement scores, however, are subject specific and have been reported separately.

101 <http://timssandpirls.bc.edu/timss2011/index.html>.

**Table 7.15 School emphasis on academic success – headteacher and teacher reports**

## Mathematics

Reported by principals/teachers

Students were scored according to their principals'/teachers' responses characterising five aspects on the *School Emphasis on Academic Success* scale. Students in schools where their principals'/teachers' reported a **Very High Emphasis** on academic success had a score on the scale of at least 13.3 (principals)/13.6 (teachers), which corresponds to their principals'/teachers' characterising three of the five aspects as "very high" and the other two as "high," on average. Students in schools with a **Medium Emphasis** on academic success had a score no higher than 9.2 (principals)/ 9.5 (teachers), which corresponds to their principals'/teachers' characterising three of the five aspects as "medium" and the other two as "high," on average. All other students attended schools with a **High Emphasis** on academic success.

Country		Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
		Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	<b>Principals</b>	26 (3.5)	525 (12.3)	56 (4.7)	509 (8.2)	19 (3.4)	477 (14.7)	11.6 (0.18)
	<b>Teachers</b>	16 (2.4)	526 (11.0)	59 (4.1)	508 (7.3)	24 (3.9)	488 (12.2)	11.2 (0.19)
International Avg.	<b>Principals</b>	7 (0.3)	495 (3.1)	53 (0.6)	477 (0.9)	41 (0.5)	449 (1.0)	
	<b>Teachers</b>	5 (0.3)	506 (3.4)	48 (0.6)	478 (0.9)	47 (0.5)	452 (0.9)	

Centre point of scale set at 10.

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

## Science

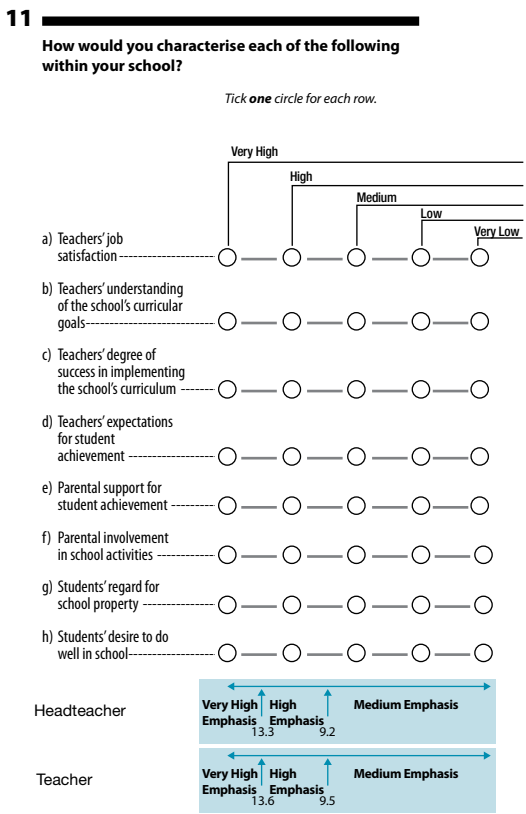
Reported by principals/teachers

Students were scored according to their principals'/teachers' responses characterizing five aspects on the *School Emphasis on Academic Success* scale. Students in schools where their principals'/teachers' reported **Very High Emphasis** on academic success had a score on the scale of at least 13.3 (principals)/13.6 (teachers), which corresponds to their principals' characterizing three of the five aspects as "very high" and the other two as "high," on average. Students in schools with a **Medium Emphasis** on academic success had a score no higher than 9.2 (principals)/9.5 (teachers), which corresponds to their principals'/teachers' characterizing three of the five aspects as "medium" and the other two as "high," on average. All other students attended schools with a **High Emphasis** on academic success.

Country		Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
		Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	<b>Principals</b>	26 (3.5)	553 (11.3)	56 (4.7)	534 (7.7)	19 (3.4)	506 (14.1)	11.6 (0.18)
	<b>Teachers</b>	16 (2.5)	554 (14.5)	60 (3.6)	533 (5.9)	24 (3.2)	514 (12.0)	11.1 (0.15)
International Avg.	<b>Principals</b>	7 (0.3)	504 (2.8)	53 (0.6)	486 (0.9)	41 (0.5)	460 (1.0)	
	<b>Teachers</b>	5 (0.2)	504 (3.2)	50 (0.5)	487 (0.8)	46 (0.5)	463 (0.9)	

Centre point of scale set at 10.

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



Items a, f and g did not contribute to this scale.

Source: Exhibit 6.2 and 6.4, international mathematics report and international science report; question adapted from the international version of the TIMSS 2011 School Questionnaire and Mathematics and Science Teacher Questionnaires<sup>102</sup>

Based on responses from headteachers, schools in England were categorised as placing more emphasis on academic success than other participating countries: in England 26 per cent of pupils were in schools categorised as placing a *Very High Emphasis* on academic success. Only one country (Qatar) and two benchmarking participants had a higher percentage of pupils in this category. This was a much higher percentage of pupils compared with the findings for Y5, where only 10 per cent of pupils were in schools categorised as placing a *Very High Emphasis* on academic success.

The pattern in the responses from teachers was very similar to those of headteachers. That is, compared with other participating countries, responses from England's teachers placed a relatively high percentage of pupils (16 per cent) in the *Very High Emphasis* category. However, this was lower than the percentage in this category based on the responses from headteachers. This was the case in some other countries, but the opposite of the situation at Y5. In the countries that performed significantly better than England in mathematics and/or science at Y9, there was substantial variation in the reported emphasis placed on academic success.<sup>103</sup>

Internationally, based on responses from headteachers and teachers, greater emphasis on academic success was associated with higher average achievement scores. However, in England, the size of the standard errors indicates that any differences are unlikely to be statistically significant.

102 <http://timssandpirls.bc.edu/timss2011/index.html>

103 See Exhibits 6.2 and 6.4 in the international mathematics and science reports.

## 7.2.6 Teachers' ratings of the extent to which their schools are safe and orderly

This section describes teachers' perceptions of school safety. The teachers of Y9 pupils were asked about the behaviour of pupils and safety in their school (the statements given can be seen in Table 7.16). Based on responses to these statements, a scale was constructed and pupils were categorised as being in schools that, according to their teachers' perceptions, were: *Safe and Orderly*, *Somewhat Safe and Orderly* or *Not Safe and Orderly* (details of how pupils were assigned to each band is provided in Table 7.16). As with the other teacher reported data, this section reports the percentages of the pupils taught by teachers who had particular views about safety in their school rather than the percentages of teachers who held these views. In England, the average scale score for mathematics was 10.6, and for science it was 10.2. Both scores were within the *Somewhat Safe and Orderly* category overall.

**Table 7.16 Safe and orderly school**

### Mathematics

*Reported by Teachers*

Students were scored according to their teachers' degree of agreement with five statements on the *Safe and Orderly School* scale. Students in **Safe and Orderly** schools had a score on the scale of at least 10.7, which corresponds to their teachers "agreeing a lot" with three of the five qualities of a safe and orderly school and "agreeing a little" with the other two, on average. Students in **Not Safe and Orderly** schools had a score no higher than 6.8, which corresponds to their teachers "disagreeing a little" with three of the five qualities and "agreeing a little" with the other two, on average. All other students attended **Somewhat Safe and Orderly** schools.

Country	Safe and Orderly		Somewhat Safe and Orderly		Not Safe and Orderly		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	53 (4.5)	521 (7.2)	42 (4.2)	487 (10.3)	6 (1.9)	505 (19.1)	10.6 (0.19)
International Avg.	45 (0.5)	479 (1.0)	49 (0.6)	458 (0.9)	6 (0.3)	445 (3.1)	

Centre point of scale set at 10.

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

### Science

*Reported by Teachers*

Students were scored according to their teachers' degree of agreement with five statements on the *Safe and Orderly School* scale. Students in **Safe and Orderly** schools had a score on the scale of at least 10.7, which corresponds to their teachers "agreeing a lot" with three of the five qualities of a safe and orderly school and "agreeing a little" with the other two, on average. Students in **Not Safe and Orderly** schools had a score no higher than 6.8, which corresponds to their teachers "disagreeing a little" with three of the five qualities and "agreeing a little" with the other two, on average. All other students attended **Somewhat Safe and Orderly** schools.

Country	Safe and Orderly		Somewhat Safe and Orderly		Not Safe and Orderly		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	46 (3.0)	544 (7.3)	46 (3.0)	522 (7.1)	8 (1.6)	516 (15.1)	10.2 (0.13)
International Avg.	45 (0.5)	488 (0.9)	50 (0.5)	470 (0.8)	6 (0.3)	457 (2.3)	

Centre point of scale set at 10.

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

**7** **Thinking about your current school, indicate the extent to which you agree or disagree with each of the following statements.**

*Tick one circle for each row.*

Agree a lot      Agree a little      Disagree a little      Disagree a lot

a) This school is located in a safe area .....

b) I feel safe at this school .....

c) This school's security policies and practices are sufficient .....

d) The students behave in an orderly manner .....

e) The students are respectful of the teachers .....

Safe and Orderly      Somewhat Safe and Orderly      Not Safe and Orderly

10.7      6.8

Source: Exhibit 6.8, international mathematics and science reports; question adapted from the international version of the TIMSS 2011 Mathematics and Science Teacher Questionnaires<sup>104</sup>

Compared with the Y5 pupils, a smaller percentage of Y9 pupils were taught by teachers who judged their school to be *Safe and Orderly*. This was the case for both mathematics and science (53 and 46 per cent of Y9 pupils were taught mathematics and science respectively by teachers who judged their schools to be *Safe and Orderly*. This compared with over 65 per cent for each subject at Y5). There was a lot of variation across countries in terms of the percentage of pupils in each of the three categories of this scale.

Across countries, being in a school perceived by teachers to be *Safe and Orderly* appeared to be associated with higher pupil achievement, as demonstrated in the international average achievement scores (Table 7.16). However, this relationship across the three categories was not seen in England.<sup>105</sup>

### 7.2.7 Teachers' ratings of the extent of school discipline and safety

Headteachers were asked about the degree to which a number of potential safety and discipline issues were a problem in their school (these questions and details of how the *School Discipline and Safety* scale was constructed can be found in Table 7.17). While this section reports headteachers' perceptions of school discipline and safety, it is important to recognise that findings are presented as the percentage of pupils whose headteachers hold these views. In England, the average scale score was 10.6 for both subjects: within the *Minor Problems* category overall.

104 <http://timssandpirls.bc.edu/timss2011/index.html>

105 Apparent differences are not likely to be significant across all three categories.

**Table 7.17 School discipline and safety**

**Mathematics**

*Reported by Principals*

Students were scored according to their principals' responses concerning eleven potential school problems on the *School Discipline and Safety* scale. Students in schools with **Hardly Any Problems** had a score on the scale of at least 12.0, which corresponds to their principals reporting "not a problem" for six of the eleven discipline and safety issues and "minor problem" for the other five, on average. Students in schools with **Moderate Problems** had a score no higher than 8.4, which corresponds to their principals reporting "moderate problem" for six of the eleven issues and "minor problem" for the other five, on average. All other students attended schools with **Minor Problems**.

Country	Hardly Any Problems		Minor Problems		Moderate Problems		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	19 (3.9)	519 (13.0)	76 (4.3)	508 (7.4)	5 (2.3)	456 (31.6)	10.6 (0.14)
International Avg.	16 (0.4)	483 (1.7)	66 (0.5)	467 (0.7)	18 (0.4)	437 (1.8)	

Centre point of scale set at 10.

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

**Science**

*Reported by Principals*

Students were scored according to their principals' responses concerning eleven potential school problems on the *School Discipline and Safety* scale. Students in schools with **Hardly Any Problems** had a score on the scale of at least 12.0, which corresponds to their principals reporting "not a problem" for six of the eleven discipline and safety issues and "minor problem" for the other five, on average. Students in schools with **Moderate Problems** had a score no higher than 8.4, which corresponds to their principals reporting "moderate problem" for six of the eleven issues and "minor problem" for the other five, on average. All other students attended schools with **Minor Problems**.

Country	Hardly Any Problems		Minor Problems		Moderate Problems		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	19 (3.9)	548 (12.2)	76 (4.3)	534 (6.8)	5 (2.3)	484 (42.6)	10.6 (0.14)
International Avg.	16 (0.4)	492 (1.7)	66 (0.5)	477 (0.7)	18 (0.4)	452 (2.0)	

Centre point of scale set at 10.

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

**12**

**A. To what degree is each of the following a problem among Year 9 students in your school?**

Tick **one** circle for each row.

Not a problem      Minor problem      Moderate problem      Serious problem

a) Arriving late at school ----- ○ ----- ○ ----- ○ ----- ○

b) Absenteeism (i.e. unjustified absences) ----- ○ ----- ○ ----- ○ ----- ○

c) Classroom disturbance ----- ○ ----- ○ ----- ○ ----- ○

d) Cheating ----- ○ ----- ○ ----- ○ ----- ○

e) Swearing ----- ○ ----- ○ ----- ○ ----- ○

f) Vandalism ----- ○ ----- ○ ----- ○ ----- ○

g) Theft ----- ○ ----- ○ ----- ○ ----- ○

h) Intimidation or verbal abuse among students (including texting, emailing, etc.) ----- ○ ----- ○ ----- ○ ----- ○

i) Physical injury to other students ----- ○ ----- ○ ----- ○ ----- ○

j) Intimidation or verbal abuse of teachers or staff (including texting, emailing, etc.) ----- ○ ----- ○ ----- ○ ----- ○

k) Physical injury to teachers or staff ----- ○ ----- ○ ----- ○ ----- ○

← Hardly Any Problems (12.0)      Minor Problems      Moderate Problems (8.4) →

Source: Exhibit 6.10, international mathematics and science reports; question adapted from the international version of the TIMSS 2011 School Questionnaire<sup>106</sup>

106 <http://timssandpirls.bc.edu/timss2011/index.html>



As can be seen in Table 7.17, 19 per cent of Y9 pupils were in schools where headteachers' responses indicated that there were *Hardly Any Problems* with safety or discipline. This compared with 77 per cent of Y5 pupils. However, this lower figure for pupils aged 13-14 was in line with the international average of 16 per cent (61 per cent for pupils aged 9 -10). Notably, two participants that performed significantly better than England in mathematics and/or science had a smaller percentage of pupils in this category (Minnesota and North Carolina).

In England, there was not a clear association between the perceived level of discipline and safety in a school and the average achievement of pupils in mathematics and science.<sup>107</sup>

### 7.2.8 Teachers' reports of the extent to which their teaching is limited by disruptive or uninterested pupils

The teachers of Y9 pupils were also asked about the extent to which disruptive or uninterested pupils limited their ability to teach. Their responses were grouped into the following two categories: *some or not at all* or *a lot*. As these questions were used in the 2007 TIMSS cycle we are able to explore trends over time. However, as noted in section 7.1.8, the response categories changed in 2011 and therefore we can only reliably compare those teachers who used the response category *a lot*.

**Table 7.18 Teaching limited by disruptive or uninterested students**

#### Mathematics

*Reported by Teachers*

Country	Students in Classrooms Where Teachers Report Instruction Is Limited by Disruptive Students				Students in Classrooms Where Teachers Report Instruction Is Limited by Uninterested Students			
	Some or Not At All		A Lot		Some or Not At All		A Lot	
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement
England	83 (3.1)	518 (6.1)	17 (3.1)	448 (12.8)	88 (2.6)	516 (6.0)	12 (2.6)	436 (13.1)
International Avg.	83 (0.4)	472 (0.6)	17 (0.4)	444 (1.8)	76 (0.5)	475 (0.7)	24 (0.5)	441 (1.5)

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

#### Science

*Reported by Teachers*

Country	Pupils in Classrooms Where Teachers Report Instruction Is Limited by Disruptive Students				Pupils in Classrooms Where Teachers Report Instruction Is Limited by Uninterested Students			
	Some or Not At All		A Lot		Some or Not At All		A Lot	
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement
England	r 83 (2.7)	538 (5.9)	17 (2.7)	506 (11.1)	r 90 (2.0)	534 (5.7)	10 (2.0)	511 (10.9)
International Avg.	83 (0.4)	481 (0.6)	17 (0.4)	462 (1.8)	79 (0.4)	482 (0.6)	21 (0.4)	456 (1.7)

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

An "r" indicates data are available for at least 70% but less than 85% of the students.

Source: Exhibit 8.24 international mathematics and science reports

107 Based on the size of the standard errors, the apparent differences are unlikely to be statistically significant.

Table 7.18 shows that, for both mathematics and science, 17 per cent of pupils in Y9 were taught by teachers who reported that their teaching is limited *a lot* by disruptive pupils. The percentage of pupils taught by teachers reporting *a lot* of limitations due to uninterested pupils was slightly lower for both mathematics (12 per cent) and science (10 per cent). All these percentages were higher than the equivalent percentages for Y5. In 2007 the equivalent percentages for Y9 pupils for mathematics were: 16 per cent for disruptive pupils and 11 per cent for uninterested pupils. The equivalent 2007 percentages for science were: 18 per cent for disruptive pupils and 15 per cent for uninterested pupils. This shows that the findings in 2011 were broadly comparable with those for 2007 but slightly lower for pupils uninterested in science in 2011.

Internationally there was a varied picture: some of the higher achieving countries had a large percentage of pupils taught by teachers who reported that their teaching is limited *a lot* by disruptive or uninterested pupils. A few TIMSS participants, with performance significantly higher than England, had a smaller percentage of pupils taught by teachers who reported that their teaching is limited *a lot* by disruptive or uninterested pupils. However, compared with England, Chinese Taipei and Korea had larger percentages of pupils taught by teachers who reported that their teaching is limited to a greater extent by disruptive and/or uninterested pupils, and this was the case for both mathematics and science.

At Y5 in England, large differences were observed for both mathematics and science in the achievement scores of those pupils whose teachers reported being limited *some or not at all* by uninterested or disruptive pupils and those whose teachers reported being limited *a lot* by these pupils. A similar difference was seen at Y9 for mathematics but the apparent differences for science are not likely to be significant.<sup>108</sup>

### 7.2.9 Pupils' reports of bullying in school

Pupils in Y9 were asked how often they had experienced six specific 'bullying' behaviours in their school. This was the same question that Y5 pupils answered (the list of behaviours can be seen below Table 7.19). Pupils were categorised according to the frequency with which they had experienced the behaviours *during this year* (details of how pupils were categorised is provided in Table 7.19). In England, the average scale score for mathematics and science was 10.4; this score was within the *Almost Never* category of the *Students Bullied at School* scale overall.

**Table 7.19 Pupils bullied at school**

#### Mathematics

*Reported by Students*

Students were scored according to their responses to how often they experienced six bullying behaviors on the *Students Bullied at School* scale. Students bullied **Almost Never** had a score on the scale of at least 9.6, which corresponds to "never" experiencing three of the six bullying behaviors and each of the other three behaviors "a few times a year," on average. Students bullied **About Weekly** had a score no higher than 7.7, which corresponds to their experiencing each of three of the six behaviors "once or twice a month" and each of the other three "a few times a year," on average. All other students were bullied **About Monthly**.

Country	Almost Never		About Monthly		About Weekly		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	68 (1.1)	509 (5.6)	24 (0.7)	511 (6.0)	7 (0.6)	486 (11.1)	10.4 (0.05)
International Avg.	59 (0.2)	473 (0.6)	29 (0.1)	467 (0.7)	12 (0.1)	441 (1.0)	

Centre point of scale set at 10.

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

108 <http://timssandpirls.bc.edu/timss2011/index.html>

## Science

### Reported by Students

Students were scored according to their responses to how often they experienced six bullying behaviors on the *Pupils Bullied at School* scale. Students bullied **Almost Never** had a score on the scale of at least 9.6, which corresponds to “never” experiencing three of the six bullying behaviors and each of the other three behaviors “a few times a year,” on average. Students bullied **About Weekly** had a score no higher than 7.7, which corresponds to their experiencing each of three of the six behaviors “once or twice a month” and each of the other three “a few times a year,” on average. All other students were bullied **About Monthly**.

Country	Almost Never		About Monthly		About Weekly		Average Scale Score
	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	Per cent of Students	Average Achievement	
England	68 (1.1)	535 (5.1)	24 (0.7)	537 (5.5)	7 (0.6)	515 (10.9)	10.4 (0.05)
International Avg.	59 (0.2)	483 (0.6)	29 (0.1)	478 (0.7)	12 (0.1)	452 (1.1)	

Centre point of scale set at 10.

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

**13**

**During this year, how often have any of the following things happened to you at school?**

Tick **one** box for each row.

	At least once a week	Once or twice a month	A few times a year	Never
a) I was made fun of or called names	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) I was left out of games or activities by other students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Someone spread lies about me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Something was stolen from me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) I was hit or hurt by other student(s) (e.g. shoving, hitting, kicking)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) I was made to do things I didn't want to do by other students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Source: Exhibit 6.12, international mathematics and science reports; question adapted from the international version of the TIMSS 2011 Student Questionnaire<sup>109</sup>

Sixty-eight per cent of Y9 pupils in England were categorised as experiencing these six bullying behaviours *Almost Never*. Pupils in Y9 reported experiencing these bullying behaviours less frequently than pupils in Y5, where the equivalent percentage of pupils was 45 per cent. This might reflect a real difference in experience or differences in perception or reporting. Only 11 participants had a higher percentage of pupils who reported experiencing the six bullying behaviours *Almost Never*.

Across countries, pupils' reports about the frequency with which they experienced the six bullying behaviours appeared to be associated with average achievement in mathematics and science, as demonstrated in the international average achievement scores (as shown in Table 7.19). That is, increased frequency of bullying (as described by the categories of the *Students Bullied at School* scale) was related to a decrease in average mathematics achievement in 13–14 year olds. In England, although there were apparent differences in achievement between the groups of pupils, the score differences were small relative to the size of the standard errors and are therefore unlikely to be statistically significant across the three categories.

109 <http://timssandpirls.bc.edu/timss2011/index.html>

As nearly a quarter of Y9 pupils' responses put them in the category of experiencing bullying behaviour *About Monthly*, it is important to establish whether there was a similar finding in TIMSS 2007 or whether there has been a change in the frequency of bullying reported by Y9 pupils since the last TIMSS survey. As was the case for Y5 pupils, the scale and the response categories have changed since 2007 and therefore a complete comparison is not possible (details of how comparisons were made is given in section 7.1.9). Table 7.20 shows the findings for the two surveys.

**Table 7.20 Trends in pupils bullied at school**

Questionnaire item	2007 percentage of Y9 pupils	2011 percentage of Y9 pupils
I was made fun of or called names	26	27
I was hit or hurt by other children (e.g. <i>shoving, hitting, kicking</i> )	18	10
I was made to do things I didn't want to do by other children	7	4

Note: standard errors are not available for this data.

Source: derived from national dataset for TIMSS 2011<sup>110</sup> and weighted almanacs for TIMSS 2007 (Foy and Olson, 2009)

Table 7.20 shows that the percentages of pupils in 2011 who reported that they had been made fun of or called names, or were made to do things they did not want to do by others were similar to the percentages for 2007. The biggest change (a reduction), as was the case for Y5 pupils, was the percentage of Y9 pupils reporting that they had been hit or hurt by other students.<sup>111</sup>

110 See the TIMSS 2011 international database at <http://timssandpirls.bc.edu/timss2011/index.html>

111 In the context that pupils were not asked exactly the same question, in 2011 there were additional response categories and pupils were not specifically asked about the last month. In addition, the differences have not been tested to ascertain whether or not they are statistically significant.