

# Chapter 2 Range of attainment in 2011 and the trend

## Chapter outline

This chapter outlines the distribution of attainment in PIRLS in 2011 and over time. The performance of the five highest achieving countries is compared to that of England.

PIRLS reports achievement at four points along the performance scale and these points are known as international 'benchmarks'. The proportions reaching each benchmark in 2011 are compared with the proportions in the previous two surveys.

Some sample items from PIRLS 2011 are included to illustrate the types of questions at each of the international benchmarks.

## Key findings

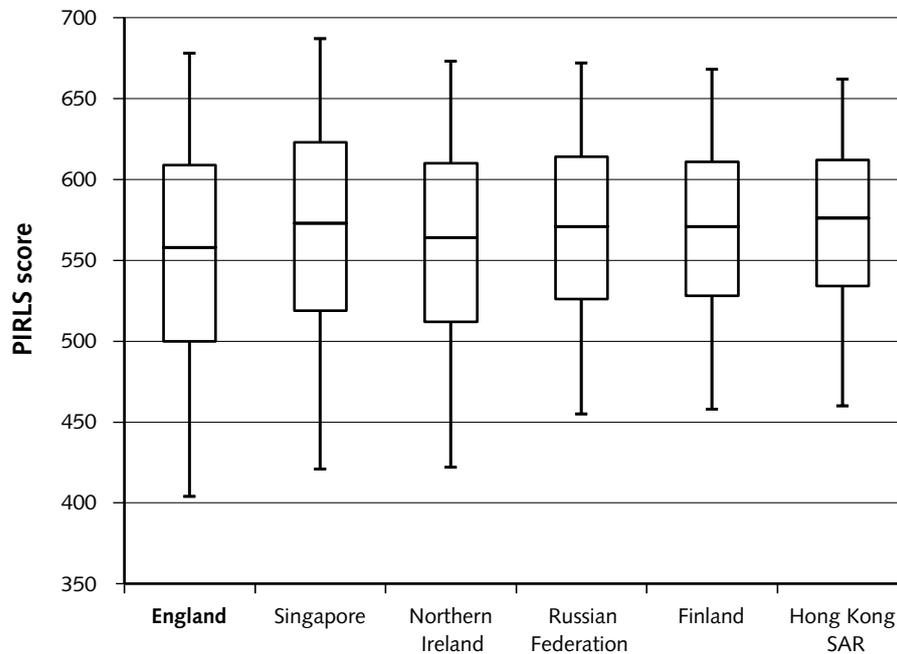
- There was a wide distribution of scores in England. The highest attaining pupils were among the best readers in the survey, but the lower attaining readers did less well than the weakest readers in some other countries.
- This wide range of achievement was characteristic of England's performance in PIRLS 2001 and 2006.
- England had one of the largest proportions of pupils reaching the Advanced International Benchmark (18 per cent). There were significantly higher proportions at each benchmark in England compared to 2006.
- The proportion of pupils failing to meet the Low International Benchmark is similar to the proportion that do not achieve level 3 or above in National Curriculum tests of reading in England at the end of primary school.

## 2.1 The range in attainment

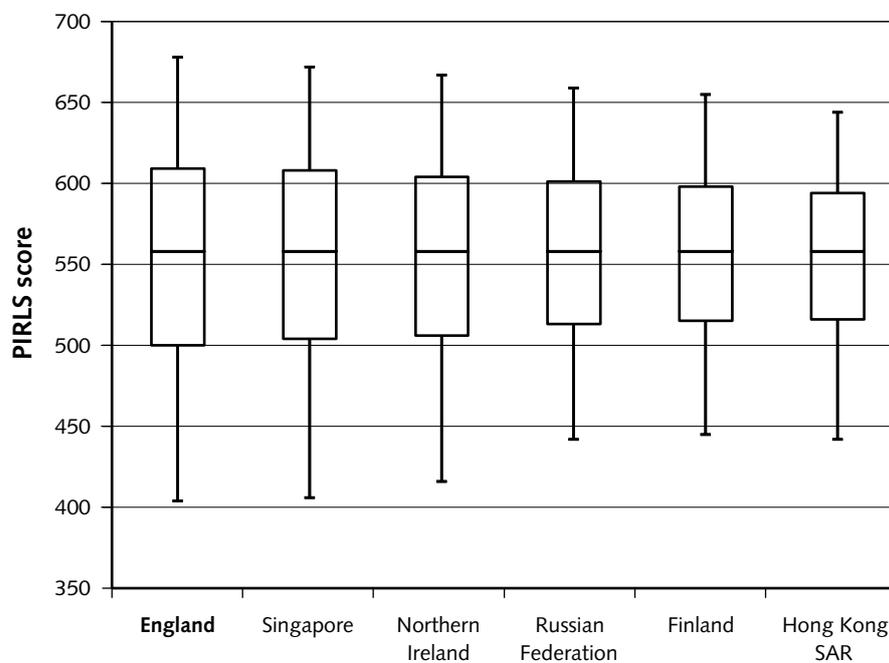
There was a wide distribution of PIRLS scores in England. Whilst the most able readers were among the best readers in the survey, the weakest readers achieved less well than the weakest readers in many other countries. A total of 274 scale points separated pupils in England at the 95<sup>th</sup> and the 5<sup>th</sup> percentiles, i.e. the top and the bottom five per cent of pupils; the international average was 249 scale points. Among the countries scoring higher than England in 2011, the range of attainment in Singapore was similarly wide, but the ranges in Hong Kong, the Russian Federation and Finland were noticeably narrower. This wide range in achievement in England has been evident in PIRLS results from the first survey in 2001.

High achieving pupils in England reached levels similar to the high achievers in Singapore and higher than the most able readers in the three top performing countries (Hong Kong, the Russian Federation and Finland). Conversely, low attaining pupils in England scored less well than the low attaining pupils in the high performing countries. This difference is illustrated in Figure 2.1 and Figure 2.2<sup>1</sup>.

**Figure 2.1 Box and whisker plots for selected countries (whiskers represent 5<sup>th</sup> and 95<sup>th</sup> percentiles)**



**Figure 2.2 Box and whisker plots for selected countries (whiskers represent 5<sup>th</sup> and 95<sup>th</sup> percentiles, medians standardised to England)**



<sup>1</sup> Figure 2.1 presents the score distributions of selected countries in a 'box-and-whisker' format where the box spans the 25<sup>th</sup> and 75<sup>th</sup> percentiles, the line in the box represents the 50<sup>th</sup> percentile (median) and the whiskers extend to the 5<sup>th</sup> and 95<sup>th</sup> percentiles. In order to compare the shape of the attainment distributions across countries, they have been standardised to the English median in Figure 2.2. This allows comparison of the extent of the distribution tails directly between countries. Figure 2.2 is *only* to explore distribution shape; it should not be used for any other purpose.

Figures 2.1 and 2.2 show that while England has the widest spread of scores, the distribution for Singapore is very similar. The difference between the distributions is greatest from the 5<sup>th</sup> to the 25<sup>th</sup> percentile, where England, Singapore and Northern Ireland (the three countries of this subset which tested in English) have a wider distribution than the other three countries. The same pattern is seen from the 75<sup>th</sup> to the 95<sup>th</sup> percentiles. Figures 2.1 and 2.2 also make it clear that the performance of pupils at the 5<sup>th</sup> and 25<sup>th</sup> percentiles in the Russian Federation, Finland and Hong Kong is better than that of pupils at these points in the other three countries. This is true both in absolute terms and relative to where the median lies.

## 2.2 Achievement at the international benchmarks

Achievement on the PIRLS scale is described at four points, known as international benchmarks. Certain reading behaviours and skills characterise performance at each benchmark and these are summarised in Table 2.1.

**Table 2.1 International benchmarks of reading achievement**

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### Advanced International Benchmark (scale score of 625)

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When reading **literary** texts, pupils can:

- integrate ideas and evidence across a text to appreciate overall themes;
- interpret story events and character actions to provide reasons, motivations, feelings and character traits with full text-based support.

When reading **information** texts, pupils can:

- distinguish and interpret complex information from different parts of the text, and provide full text-based support;
  - integrate information across a text to provide explanations, interpret significance, and sequence activities;
  - evaluate visual and textual features to explain their function.
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### High International Benchmark (scale score of 550)

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When reading **literary** texts, pupils can:

- locate and distinguish significant actions and details embedded across the text;
- make inferences to explain relationships between intentions, actions, events and feelings, and give text-based support;
- interpret and integrate story events and character actions and traits from different parts of the text;
- evaluate the significance of events and actions across the entire story;
- recognise the use of some language features (e.g., metaphor, tone, imagery).

When reading **information** texts, pupils can:

- locate and distinguish relevant information within a dense text or a complex table;
  - make inferences about logical connections to provide explanations and reasons;
  - integrate textual and visual information to interpret the relationship between ideas;
  - evaluate content and textual elements to make a generalisation.
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### Intermediate International Benchmark (scale score 475)

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When reading **literary** texts, pupils can:

- retrieve and reproduce explicitly stated actions, events and feelings;
- make straightforward inferences about the attributes, feelings and motivations of main characters;
- interpret obvious reasons and causes and give simple explanations;
- begin to recognise language features and style.

When reading **information** texts, pupils can:

- locate and reproduce two or three pieces of information from within the text;
  - use subheadings, text boxes and illustrations to locate parts of the text.
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### Low International Benchmark (scale score 400)

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When reading **literary** texts, pupils can:

- locate and retrieve an explicitly stated detail.

When reading **information** texts, pupils can:

- locate and reproduce explicitly stated information that is at the beginning of the text.
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Appendix C compares the international benchmark descriptions with the English National Curriculum assessment focuses for reading.

### **Interpreting the data: international benchmarks**

The PIRLS achievement scales summarise pupil performance on a scale with a centre point of 500 and a standard deviation of 100. PIRLS reports achievement at four points along the scale as international benchmarks. The Advanced International Benchmark is set at a scale score of 625, the High International Benchmark at 550, the Intermediate International Benchmark at 475, and the Low International Benchmark at 400. The benchmark descriptions summarise what pupils scoring at each PIRLS International Benchmark typically know and can do in reading.

Table 2.2 presents the percentage of pupils reaching each international benchmark, with countries in descending order according to the percentage reaching the Advanced International Benchmark.

**Table 2.2 Performance at the international benchmarks of reading achievement**

Country	Percentages of pupils reaching international benchmarks	Percentages of pupils reaching international benchmarks				Advanced International Benchmark (625)	High International Benchmark (550)	Intermediate International Benchmark (475)	Low International Benchmark (400)
		● Advanced	○ High	● Intermediate	○ Low				
<sup>2</sup> Singapore					24 (1.6)	62 (1.8)	87 (1.1)	97 (0.4)	
Russian Federation					19 (1.2)	63 (1.7)	92 (1.1)	99 (0.2)	
<sup>†</sup> Northern Ireland					19 (1.2)	58 (1.4)	87 (0.9)	97 (0.6)	
Finland					18 (0.9)	63 (1.3)	92 (0.7)	99 (0.2)	
<b><sup>†</sup> England</b>					<b>18 (1.1)</b>	<b>54 (1.3)</b>	<b>83 (1.1)</b>	<b>95 (0.5)</b>	
<sup>3</sup> Hong Kong SAR					18 (1.2)	67 (1.5)	93 (0.8)	99 (0.2)	
<sup>2</sup> United States					17 (0.7)	56 (0.8)	86 (0.6)	98 (0.3)	
Ireland, Rep. of					16 (0.9)	53 (1.4)	85 (0.8)	97 (0.5)	
<sup>3</sup> Israel					15 (0.9)	49 (1.3)	80 (1.3)	93 (0.8)	
New Zealand					14 (0.7)	45 (1.1)	75 (0.9)	92 (0.5)	
<sup>2</sup> Canada					13 (0.7)	51 (1.1)	86 (0.6)	98 (0.2)	
Chinese Taipei					13 (0.9)	55 (1.3)	87 (0.7)	98 (0.3)	
<sup>2</sup> Denmark					12 (0.8)	55 (1.2)	88 (0.8)	99 (0.2)	
Hungary					12 (0.9)	48 (1.5)	81 (1.2)	95 (0.7)	
Bulgaria					11 (0.8)	45 (2.0)	77 (1.9)	93 (1.0)	
<sup>2</sup> Croatia					11 (0.7)	54 (1.3)	90 (0.7)	99 (0.2)	
Australia					10 (0.7)	42 (1.1)	76 (1.0)	93 (0.7)	
Italy					10 (0.7)	46 (1.4)	85 (1.1)	98 (0.4)	
Germany					10 (0.8)	46 (1.4)	85 (1.0)	98 (0.3)	
Portugal					9 (1.1)	47 (1.8)	84 (1.2)	98 (0.5)	
Sweden					9 (0.8)	47 (1.6)	85 (1.0)	98 (0.3)	
Czech Republic					8 (0.9)	50 (1.4)	87 (0.9)	98 (0.5)	
Slovak Republic					8 (0.6)	44 (1.5)	82 (1.3)	96 (0.8)	
Slovenia					8 (0.7)	42 (1.2)	79 (0.9)	95 (0.6)	
Poland					7 (0.6)	39 (1.2)	77 (0.9)	95 (0.5)	
Romania					7 (0.7)	32 (1.6)	65 (2.1)	86 (1.5)	
<sup>†</sup> Netherlands					7 (0.5)	48 (1.5)	90 (0.8)	100 (0.2)	
<sup>1 2</sup> Lithuania					6 (0.5)	39 (1.4)	80 (1.2)	97 (0.4)	
France					5 (0.5)	35 (1.6)	75 (1.5)	95 (0.8)	
Austria					5 (0.5)	39 (1.5)	80 (0.9)	97 (0.3)	
Malta					4 (0.4)	24 (0.7)	55 (0.8)	78 (0.6)	
Spain					4 (0.5)	31 (1.3)	72 (1.2)	94 (0.7)	
Trinidad and Tobago					3 (0.5)	19 (1.4)	50 (1.9)	78 (1.5)	
United Arab Emirates					3 (0.3)	14 (0.6)	38 (1.0)	64 (0.9)	
<sup>1</sup> Georgia					2 (0.3)	21 (1.2)	60 (1.6)	86 (1.4)	
<sup>2 †</sup> Belgium (French)					2 (0.5)	25 (1.4)	70 (1.7)	94 (1.1)	
<sup>2</sup> Qatar					2 (0.5)	12 (1.2)	34 (1.4)	60 (1.5)	
<sup>‡</sup> Norway					2 (0.4)	25 (1.5)	71 (1.3)	95 (0.7)	
Iran, Islamic Rep. of					1 (0.2)	13 (0.9)	45 (1.6)	76 (1.1)	
Colombia					1 (0.3)	10 (1.3)	38 (2.1)	72 (1.9)	
Saudi Arabia					1 (0.2)	8 (1.0)	34 (2.0)	65 (1.9)	
<sup>2</sup> Azerbaijan					0 (0.3)	9 (0.9)	45 (2.1)	82 (1.6)	
<sup>ψ</sup> Oman					0 (0.1)	5 (0.4)	21 (0.9)	47 (1.2)	
Indonesia					0 (0.1)	4 (0.6)	28 (1.9)	66 (2.2)	
<sup>✱</sup> Morocco					0 (0.0)	1 (0.2)	7 (0.7)	21 (1.3)	
<b>International Median</b>					<b>8</b>	<b>44</b>	<b>80</b>	<b>95</b>	

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

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

See Appendix C.2 in the international report for target population coverage notes 1, 2, and 3. See Appendix C.5 for sampling guidelines and sampling participation notes † and ‡.

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

Source Exhibit 2.2 in the 2011 international PIRLS report

## Interpreting the data: performance at the international benchmarks

Table 2.2 indicates the percentage of pupils reaching each of the four benchmarks and this information is summarised in the series of dots on the chart. Percentages are cumulative (reading the chart from left to right). Thus, for example, for each country the black dot shows the percentage reaching at least the Advanced Benchmark. The clear dot then shows the percentage reaching at least the High Benchmark and this figure includes those who reached the Advanced Benchmark. The darker shaded dot indicates the percentage reaching at least the Intermediate Benchmark, and this includes those in the two previous categories. The lighter shaded dot shows cumulatively how many reached at least the Low Benchmark. The position of that dot also indicates the percentage that did not reach any of the listed benchmarks.

England was one of eight countries in which more than 15 per cent of pupils reached the Advanced Benchmark. Singapore had almost a quarter of pupils reaching this benchmark, an achievement all the more notable considering that English is the sole language of the home for only 32 per cent of pupils in Singapore. The other countries with over 15 per cent of pupils at this benchmark include Northern Ireland, the United States and the Republic of Ireland, all of which also tested in English. In contrast to this finding of high achievement, there are fewer pupils (54 per cent) who achieve the next benchmark ('High') in England compared to other high performing countries.

The proportions of pupils in England reaching the international benchmarks can be compared with the end of key stage 2 results in reading in 2012<sup>2</sup>. This cohort is the same as that involved in PIRLS 2011. In terms of test results, six per cent of pupils in England were working below level 3 and a further seven per cent were working at level 3, i.e. working below age expectations. In the same test, 48 per cent obtained level 5 and achieved above age expectations. Teacher assessment data is similar: five per cent of pupils were assessed as working below level 3, and a further nine per cent as working at level 3. Almost half (47 per cent) were assessed by their teachers to be working above age expectations.

<sup>2</sup> Department for Education (2012). *National Curriculum Assessments at Key Stage 2 in England, 2012 (Provisional)*. Available: <http://www.education.gov.uk/rsgateway/DB/SFR/s001087/index.shtml>

## 2.3 Trends in achievement at the international benchmarks

Table 2.3 shows the trend in the proportions of pupils reaching the international benchmarks over the course of the surveys in 2001, 2006 and 2011.

**Table 2.3 Trends in percentages of pupils reaching the international benchmarks of reading achievement**

Country	Advanced International Benchmark (625)			High International Benchmark (550)			Intermediate International Benchmark (475)			Low International Benchmark (400)		
	Per cent of pupils			Per cent of pupils			Per cent of pupils			Per cent of pupils		
	2011	2006	2001	2011	2006	2001	2011	2006	2001	2011	2006	2001
England	18	15 ↑	20	54	48 ↑	54	83	78 ↑	82	95	93 ↑	94
Hong Kong SAR	18	15 ↑	5 ↑	67	62 ↑	39 ↑	93	92	81 ↑	99	99	97 ↑
New Zealand	14	13	14	45	45	45	75	76	74	92	92	90
Russian Federation	19	19	5 ↑	63	61	39 ↑	92	90	80 ↑	99	98	96 ↑
Singapore	24	19	12 ↑	62	58	45 ↑	87	86	76 ↑	97	97	90 ↑
Sweden	9	11	15 ↓	47	53 ↓	59 ↓	85	88	90 ↓	98	98	98 ↓
United States	17	12 ↑	15 ↑	56	47 ↑	50 ↑	86	82 ↑	80 ↑	98	96 ↑	94 ↑

↑ 2011 percentage significantly higher

↓ 2011 percentage significantly lower

Table 2.3 shows relatively high proportions of pupils in England reaching the Advanced Benchmark in all three surveys, and also, compared to many other high achieving countries, a relatively large proportion failing to reach the Low Benchmark. The improvement in England's performance across all four benchmarks since the 2006 survey is also evident.

Exclusion rates may be supposed to have their greatest impact on the proportions of lower achieving pupils in some countries. The international target is that no more than five per cent of pupils are excluded from the assessment and the exclusion rate in England was 2.4 per cent in both 2006 and 2011. Hong Kong's overall exclusion rate increased dramatically in 2011 to 11.8 per cent from 3.9 per cent in 2006, although the proportion of pupils reaching the lowest benchmark was unchanged. Similarly, an increase in the exclusion rate in Singapore, from 0.9 per cent in 2006 to 6.3 per cent in 2011 was not followed by any change in the proportion of pupils reaching the lowest benchmark. In the United States, the exclusion rate rose in 2011 to 7.2 per cent from 5.9 per cent in 2006, whereas in the Russian Federation it fell from 5.9 per cent to 5.3 per cent. More information concerning exclusion rates is contained in Appendix C.6 in the international report<sup>3</sup>.

<sup>3</sup> Mullis, I.V.S., Martin, M.O., Foy, P., and Drucker, K.T. (2012). *PIRLS 2011 international results in reading*. Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Boston College. Available: <http://timssandpirls.bc.edu/pirls2011/reports/international-results-pirls.html>

## 2.4 Examples of performance at the international benchmarks

Examples A to D below show test items exemplifying attainment at each of the benchmark levels. Further examples are available in the international report<sup>4</sup>.

### Interpreting the data: example items

The items exemplify attainment at each of the benchmark levels. The data beneath each item shows the percentage correct on average internationally, the percentage correct in England, and in the country which was most successful on the item. The items are the 'source version', and are not adapted or translated. Any translations and adaptations must be approved by the International Study Centre in order to verify that the changes made do not affect the demand or intent of the question.

Each item is classified by its reading purpose and process (see chapter 5 for more detail).

### Example A – Low International Benchmark

England performed moderately well on this item with 91 per cent of pupils gaining a mark, a figure significantly higher than the international average of 89 per cent but lower than those of many countries which overall did less well than England. In the highest attaining country on this item, the Russian Federation, almost all pupils (99 per cent) selected the correct option.

Purpose: Literary experience

Process: Focus on and retrieve explicitly stated information and ideas

Description: Locate and retrieve explicitly stated detail from the beginning of the text

1. What did the farmer set out to look for at the beginning of the story?
- a calf
  - herders
  - rocky cliffs
  - an eagle chick

England: 91% (1.1) ▲

Highest percentage correct: Russian Federation 99% (0.4) ▲

International average: 89% (0.2)

( ) standard errors in parentheses

▲ per cent significantly higher than international average

SOURCE: Adapted from IEA's Progress in International Reading Literacy Study – PIRLS 2011

<sup>4</sup> Mullis, I.V.S., Martin, M.O., Foy, P., and Drucker, K.T. (2012). *PIRLS 2011 international results in reading*. Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Boston College. Available: <http://timssandpirls.bc.edu/pirls2011/reports/international-results-pirls.html>

## Example B – Intermediate International Benchmark

In England, almost three-quarters (73 per cent) of pupils gained the mark for this item although their mean score was not significantly above the international average. This can be compared with Singapore, the highest attaining country on this item, where 87 per cent of pupils were awarded a mark. As with example A, many countries which performed less well than England overall achieved a high mean score on this item.

Purpose: Literary experience

Process: Make straightforward inferences

Description: Make a straightforward inference about a character's reaction to a situation

2. At the beginning of the story, why did Tom think Jeremy was his enemy?

① He thought Jeremy was his enemy because Jeremy had a party and Tom wasn't invited, but his best friend was

The answer shown illustrates the type of response awarded the mark.

England: 73% (1.8)

Highest percentage correct: Singapore 87% (1.1) 🔴

International average: 70% (0.3)

( ) standard errors in parentheses

🔴 per cent significantly higher than international average

SOURCE: Adapted from IEA's Progress in International Reading Literacy Study – PIRLS 2011

## Example C – High International Benchmark

On this high benchmark item, over half of the pupils from England (59 per cent) gained a mark, a significantly greater proportion than the international average of 50 per cent. In the highest achieving country on this item, the Russian Federation, 75 per cent of pupils were awarded a mark.

Purpose: Literary experience

Process: Interpret and integrate ideas and information

Description: Integrate evidence to show understanding of a character's intention

14. Use what you have read to explain why Tom's dad really made Enemy Pie.

① To make them spend the day with each other to become friends

The answer shown illustrates the type of response awarded the mark.

England: 59% (1.8) 🔴

Highest percentage correct: Russian Federation 75% (1.8) 🔴

International average: 50% (0.3)

( ) standard errors in parentheses

🔴 per cent significantly higher than international average

SOURCE: Adapted from IEA's Progress in International Reading Literacy Study – PIRLS 2011

### Example D – Advanced International Benchmark

This item required three separate responses, each worth one mark. Just under half (46 per cent) of pupils in England gained all three marks, a significantly greater proportion than the international average. The equivalent figure in the highest scoring country for this item (Hong Kong) was 62 per cent.

Purpose: Acquire and use information  
 Process: Interpret and integrate ideas and information  
 Description: Interpret and integrate textual and visual information to make three contrasts

13. Later discoveries proved that Gideon Mantell was wrong about what the *Iguanodon* looked like. Fill in the blanks to complete the table.

	What Gideon Mantell thought the <i>Iguanodon</i> looked like	What scientists today think the <i>Iguanodon</i> looked like
	The <i>Iguanodon</i> walked on four legs.	The <i>Iguanodon</i> walks on 2 legs
	The <i>Iguanodon</i> had a spike on his nose	The <i>Iguanodon</i> had a spike on its thumb.
	The <i>Iguanodon</i> was 100 feet long.	The <i>Iguanodon</i> was 30 feet long

The answer shown illustrates the type of response that was awarded the maximum 3 marks.

England: 46% (2.2)   
 Highest percentage correct: Hong Kong SAR 62% (2.3)   
 International average: 32% (0.3)

( ) standard errors in parentheses  
 per cent significantly higher than international average

SOURCE: Adapted from IEA's Progress in International Reading Literacy Study – PIRLS 2011