

## Programme for International Student Assessment 2009: achievement of 15-year-olds in England

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### Main findings

Schooling systems can improve quickly. The performance of 15-year-olds in PISA's internationally standardised tests shows this. For example Israel, Portugal, Greece and Japan all improved their reading performance by more than 20 PISA score points between 2006 and 2009. This is equivalent to about half a year's schooling. But England's (and the UK's) mean score, in reading, mathematics and science, did not change significantly between 2006 and 2009 and was only average for reading and mathematics in 2009. Top-performing Shanghai-China, Korea and Finland also have high equity, having a much narrower gap than England between highest-scoring and lowest-scoring pupils.

Subject	Mean score for UK	
	2006	2009
Reading	495 (England 496, OECD 492)	<b>494 (England 495, OECD 493)</b>
Mathematics	498 (England 495, OECD 498)	<b>492 (England 493, OECD 496)</b>
Science	515 (England 516, OECD 500)	<b>514 (England 515, OECD 501)</b>

England has fallen in the international rankings in all three subjects. Two new countries / jurisdictions entered PISA for the first time in 2009 (Shanghai-China and Singapore) and significantly outperformed the UK. A number of previously participating countries have also increased their mean performance and pushed the UK down the rankings.

Subject	Rankings for UK	
	2006 (57 countries)	2009 (65 countries)
Reading	17th (England 17th)	<b>25th (England 25th)</b>
Mathematics	24th (England 25th)	<b>28th (England 27th)</b>
Science	14 <sup>th</sup> (England 14 <sup>th</sup> )	<b>16<sup>th</sup> (England 16<sup>th</sup>)</b>

## **Aims and coverage of PISA**

Countries around the world see PISA as an essential tool for measuring their schooling systems against others and learning from the best. PISA makes a major contribution by assessing the educational achievement of 15-year-olds, as they near the end of compulsory schooling. The Organisation for Economic Co-operation and Development (OECD) organises it. PISA ran previously in 2000, 2003 and 2006. Sixty-five countries took part in PISA 2009, including 34 OECD member countries and 25 members of the European Union.

## **Pupil achievement in reading**

Twelve countries performed in reading at a significantly higher level than in England. These were: Shanghai-China, Korea, Finland, Hong Kong-China, Singapore, Canada, New Zealand, Japan, Australia, Netherlands, Belgium and Norway. This was similar to the set of countries performing significantly above England in reading in PISA 2006. However, two of these countries / jurisdictions are new to PISA (Shanghai and Singapore). Fourteen countries performed at a level that was not significantly different from that of England, while the remaining 38 countries performed significantly less well.

## **Pupil achievement in mathematics**

Twenty countries performed in mathematics at a level significantly higher than England. These were: Shanghai-China, Singapore, Hong Kong-China, Korea, Chinese Taipei, Finland, Liechtenstein, Switzerland, Japan, Canada, Netherlands, Macao-China, New Zealand, Belgium, Australia, Germany, Estonia, Iceland, Denmark and Slovenia. Again, this was similar to the set of countries performing significantly above England in mathematics in PISA 2006, with the addition of Shanghai and Singapore. In 12 countries, mathematics attainment was not significantly different from that of England, while 32 countries performed significantly less well.

## **Pupil achievement in science**

In science, ten countries performed at a level significantly higher than England. These were: Shanghai-China, Finland, Hong Kong-China, Singapore, Japan, Korea, New Zealand, Canada, Estonia and Australia. Once more, this was a similar to PISA 2006, with the addition of Shanghai and Singapore. In nine countries, science attainment was not significantly different from that of England, while the remaining 45 performed significantly less well.

## **Gender differences in attainment**

Girls scored significantly higher than boys in reading, which was the case in every country, which participated in the PISA study. However,

this gender difference, while statistically significant, was not as large as that in the majority of other countries.

Boys performed significantly better than girls in mathematics. This was a common pattern internationally, with more than half the PISA countries showing a similar difference. However, England did have one of the biggest gender differences.

There was no significant gender difference in science, which was also the case for the OECD average. Performance by gender was variable across the countries that participated.

## **Range in performance**

There was a relatively large difference between the score points in reading of the lowest scoring pupils and the highest scoring pupils compared with high-performing countries such as Shanghai-China, Korea and Finland.

There was a relatively low difference between the score points in mathematics of the lowest scoring pupils and the highest scoring pupils compared with other countries. Compared with the top performing countries in the world England was lacking in high achievers in mathematics.

There was a relatively large difference between the score points in science of the lowest scoring pupils and the highest scoring pupils compared with other countries.

## **Impact of economic, social and cultural status on performance**

The Economic, Social and Cultural Status (ESCS) Index is the measure of socio-economic background in PISA. It draws on pupils' responses to questions about their parents' background and education and possessions in their homes.

England, in common with the general pattern among OECD countries, has an achievement gap between those who are highest and those who are lowest on the ESCS Index. Those in the bottom quarter of the ESCS Index have a mean reading score of 451 whilst those in the

top quarter have a mean score of 544. This compares with England's overall mean score of 495. In England, socio-economic background explains 14 per cent of the variance in scores as compared to just 9 per cent in high-performing Japan.

### **Pupils' reading habits**

Almost 40% of pupils in England never read for enjoyment. This is similar to the OECD average. Both internationally and in England, there was a large difference in scores between those who never read for enjoyment and those who do, even if only for half an hour or less each day. Responses to statements measuring attitudes to reading were on the whole similar to the OECD average.

The most popular and frequent reading materials were magazines and newspapers. Pupils read fiction more often than non-fiction books. Very few ever read comic books. Here again pupils were similar to those in other OECD countries except that they were much less likely to read comic books than the OECD average. They also reported borrowing library books less often than the OECD average.

Pupils reported a high level of activity in online communication and less activity in other types of online reading. They spend more time chatting online and reading emails than the OECD average but are similar to their OECD counterparts in the frequency of other online activities.

Pupils report reading poetry in class more frequently than their OECD counterparts, and this was the text type, which they had read most frequently for school in the previous month.

Socio-economic background had a relatively high connection with reading scores compared with other OECD countries.

### **School autonomy and leadership**

In common with those in high-performing countries, head teachers in England reported a high degree of school autonomy. A high level of responsibility for most aspects of management lay within the school. They take

a more direct role in the day-to-day teaching and learning in their schools than their counterparts in many other countries. They also report more frequent involvement in instructional leadership activities. These include using pupil performance results to develop the school's educational goals, and observing instruction in the classroom.

### **School Climate**

Here there is much to build on. Head teachers in England were more positive about their school climate than in many other countries and the extent to which issues such as truancy, disruptive pupils, alcohol and drug-taking among pupils were a problem. However, almost a quarter reported that they had a problem with teachers not meeting individual pupils' needs and teachers' low expectations of pupils. By contrast, high expectation levels tend to be a feature of the best-performing countries.

Pupils were on the whole very positive about the climate of their school, although they were least positive on the extent to which they felt their teachers were interested in or listened to them. They were generally more positive about the value of school and their relationship with their teachers than the average across OECD countries.

### **PISA across the UK**

England, Scotland and Northern Ireland perform similarly across all three subjects but the performance of Wales is significantly lower than that of the other three countries.

	England	Scotland	Northern Ireland	Wales
Reading	495	500	499	476
Mathematics	493	499	492	472
Science	515	514	511	496

### **Methodology**

PISA assesses pupils on their competence to address real life challenges involving reading, mathematics and science. This aim differentiates PISA from other pupil assessments, such as GCSEs, that measure their mastery of the school curriculum.

In each survey one of the three subjects takes precedence. Reading was the main subject in PISA 2000, mathematics in 2003 and science in 2006. For each of these years OECD established for the first time the full assessment framework for that year's main subject. Comparison over time for a subject is valid only from that year. PISA 2009, assessing reading as in 2000, represents the first repeat of a main subject.

OECD excluded England's 2003 results from the international reports because too few schools took part. Expert academic analysis also raised doubts about the representativeness of England's sample in PISA 2000.

The National Foundation for Educational Research carried out PISA 2009 on behalf of the respective governments in England, Wales and Northern Ireland, and has published separate reports. Scotland participated in the study separately. Results for the United Kingdom as a whole appear in each NFER report and in OECD's international report.

Pupils in England, Wales and Northern Ireland sat a two-hour assessment in November 2009 under test conditions, following standardised procedures implemented by all countries. Scotland tested earlier in 2009. About half the questions were on reading and the remainder on mathematics and science. A proportion of the questions were from previous cycles, providing a measure of change.

As well as tests for pupils, PISA includes questionnaires for participating pupils and schools. The pupil questionnaire provided information on pupils' economic and social backgrounds, study habits, and attitudes to reading and to reading activities in school. A school questionnaire, completed by head teachers, provided information on the school's size, intake, resources and organisation, as well as reading activities available in the school.

In England 165 schools participated in PISA 2009. The response rate for main sample schools in England was 68.9 per cent. After replacement of non-responding main sample

schools by reserve sample schools, the final response rate was 86.8 per cent.

The school response rate for the England, Wales and Northern Ireland combined sample was 70.2 per cent of main sample schools, and 87.2 per cent after replacement.

As the response rate was below that required, NFER provided analysis of the characteristics of responding and non-responding schools in England, Wales and Northern Ireland. This showed no significant differences and the PISA sampling referee accepted that there was no evidence of possible bias in the sample as a result of school non-participation.

Pupil response fully met the standards. The target was 80%. England, with 4081 pupils taking part, achieved 87.2% and the UK weighted response rate was 87.3%

### **Additional Information**

Copies of the full report are available to download free of charge at:

[www.nfer.ac.uk/PISA](http://www.nfer.ac.uk/PISA)

Copies of the full report are available on a print-on-demand basis by writing to: Publications Unit, NFER, The Mere, Upton Park, Slough, Berks., SL1 2DQ. Email: [book.sales@nfer.ac.uk](mailto:book.sales@nfer.ac.uk) Tel: 01753 637002. There is an administration charge of £20 plus postage and packing for a single copy, with a 10% discount for bulk orders of 10 copies or more.

Copies of this Research Brief (DFE-RB069) are available to download free of charge at: <http://publications.education.gov.uk/>

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