PISA 2009 Study: How big is the gap?

A comparison of pupil attainment in England with the top-performing countries

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Contents

1.   Background

1.1   PISA 2009 study

The OECD[1] Programme for International Student Assessment (PISA) aims to compare the abilities of pupils across participating OECD member states and partner countries to analyse, reason and communicate their ideas affectively. The previous PISA studies in 2000, 2003 and 2006 focussed on reading, mathematics and science respectively. The 2009 PISA study returned to reading as the main focus.

1.2   Results for pupils in England

A pupil's attainment in the PISA assessments is recorded using a scale of PISA points. To facilitate year on year comparison, pupils' scores in the 2009 PISA study have been scaled to fit the metric for pupils' points in the PISA 2000 reading study, which were normally distributed, with a mean of 500 and a standard deviation of 100 (see diagram to the right).

Distribution of pupils' reading scores in PISA 2000
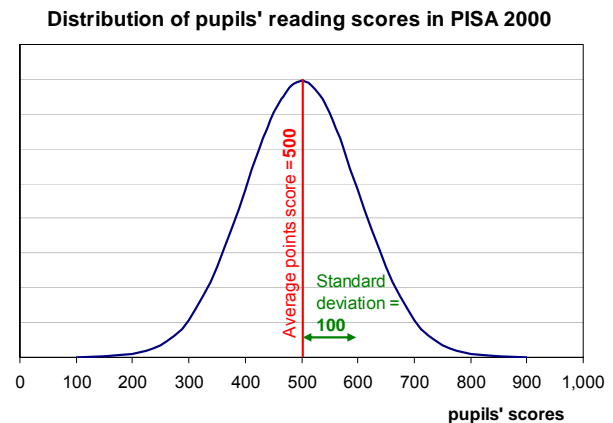
Pupils in England scored an average of 495 points in the PISA 2009 reading assessment; 493 points in mathematics and 515 points in science. Although all scores were slightly higher than the average across the OECD countries, the difference was not statistically significant and the distribution of points scored by pupils in England was very similar to the OECD average, as shown for the reading strand in figure 1[2].

Figure 1: Difference between the distributions of pupils' <u>reading</u> scores in England and the OECD average, PISA 2009

Source: OECD, PISA 2009 Database

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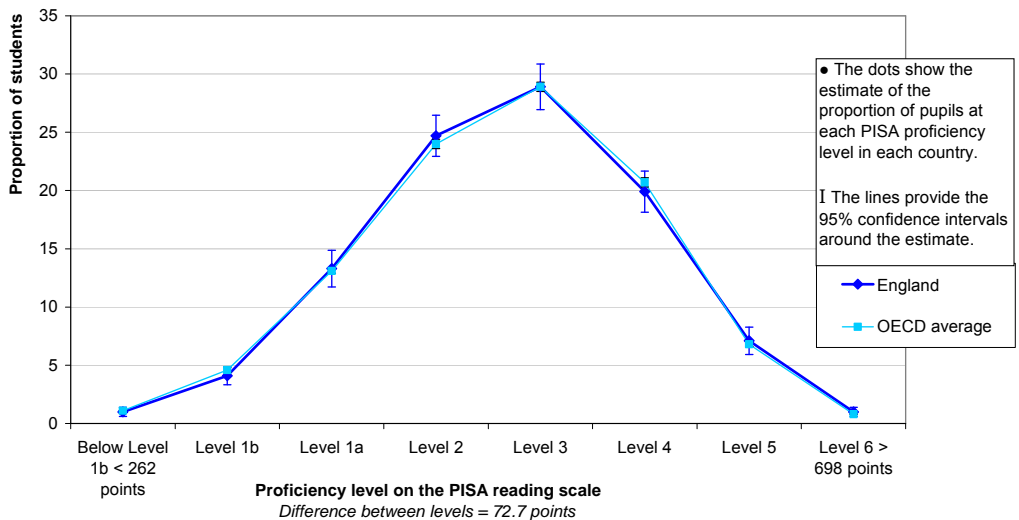
[1] [Organisation for Economic Co-operation and Development](#)
[2] For comparisons in mathematics and science see Annex A

2.   Comparing countries' performance in the PISA assessments

To visualise how pupils' scores between England and the comparison countries vary, we can compare the size of the gap (in PISA points) between the average pupil score in England and that in the comparison country.

2.1   Gap between England and the top-performing countries in the reading strand of the PISA 2009 assessment, in terms of PISA points

In 13 of the countries scoring higher than England in the reading assessment, the gap between pupils' average scores was statistically significant (as illustrated by the dark blue bars in figure 2 below). A difference of around 10 PISA points translates as a statistically significant difference between countries' average reading scores[3].

Figure 2: Gap between pupils' average scores in the reading assessment in England and the top performing countries in the reading strand, PISA 2009
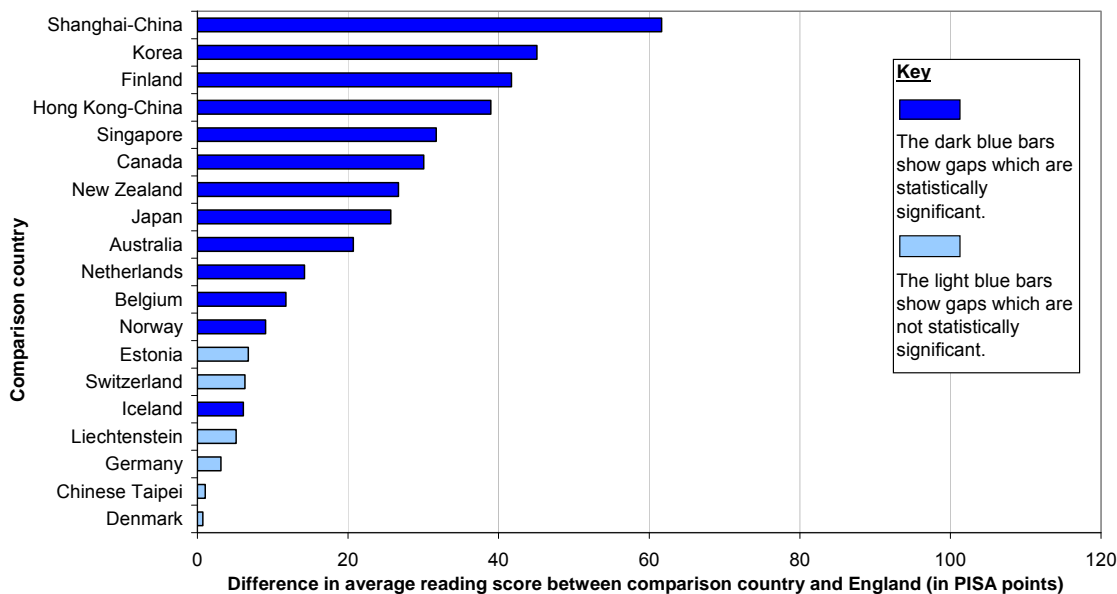
Source: OECD, PISA 2009 Database

Annex H provides more detailed information on the average pupil scores and PISA rankings for each participating country, by subject strand. Details on significant differences in pupils' average scores between countries and compared to the OECD average are also provided.

Looking at the gap in average PISA points does not help us when referring back to our own education system. In order to put these gaps in context, we need to explore the difference in attainment between countries in terms of effect sizes; this is explored in section 2.2 below.

2.2   Effect sizes

There are different ways one could reduce the gap in average pupil performance between England and the comparison countries. A straightforward option would be to increase the attainment of pupils at all parts of the range equally, resulting in an upward shift in the distribution of pupils' attainment, so that all pupils achieve higher point scores. To determine the size of this shift, we first need to convert the attainment gaps, between England and the comparison countries into a standardised measure. As the PISA scale is an arbitrary scale, a difference of 62 PISA points between countries does not have a meaning we can easily relate to. However, we can use the amount of variation between pupil scores to contextualise

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[3] Gaps in average pupil scores in the mathematics and science assessments can be found in Annex B.

this difference. To do this we recalculate the differences in average attainment as effect sizes.

Figure 3 below provides the attainment gap (in PISA points) between England and countries performing significantly higher than England in the reading strand of the PISA 2009 assessment and the effect size required for pupils in England to match pupils' performance in the comparison countries[4].

Figure 3: Difference in average scores, in PISA points, between England and the countries performing significantly better than England in the PISA 2009 reading assessment and corresponding effect size

Comparison country[1]	Difference in average pupil score (PISA points)	Effect size
Shanghai-China	62	0.6
Korea	45	0.5
Finland	42	0.4
Hong Kong-China	39	0.4
Singapore	32	0.3
Canada	30	0.3
New Zealand	27	0.3
Japan	26	0.3
Australia	21	0.2
Netherlands	14	0.1
Belgium	12	0.1
Norway	9	0.1
Iceland	6	0.1

1. Countries listed in **bold** are OECD member states.
PISA points are reported to the nearest whole number, effect sizes to 1 decimal place.

Source: OECD, PISA 2009 database

3. Translation of effect sizes into improvement in attainment in our domestic measures

The advantage of translating the difference in average PISA points scores to an effect size is that we can apply the attainment gap between England and the comparison countries to measures we are familiar with, for example: pupils' capped Key Stage 4 point scores and GCSE grades (section 3.1); proportion of pupils achieving 5 A* to C including English and maths (section 3.2).

3.1 Increase in pupils' capped GCSE point scores required to match pupil attainment in PISA 2009 top-performing countries

A pupil's capped point score, calculated when they are at the end of Key Stage 4, is the sum of the points gained from their best eight GCSE or equivalent qualifications. An A* at GCSE is worth 58 points and the points decrease by 6 for each grade, until grade G, which is worth 16 points. For equivalent qualifications, points are determined relative to how many GCSEs the qualification is worth[5].

The PISA 2009 cohort completed Key Stage 4 in summer 2010. For this year group, the average (mean) score for pupils' capped point scores was 326 (equivalent to a pupil achieving seven Cs and one B at GCSE, as an example). The standard deviation of pupils'

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[4] Annex C provides this information for the mathematics and science strands.
[5] Further information on how the capped point score is calculated and points scores for common equivalencies can be found on the Achievement and Attainment Tables website: http://www.education.gov.uk/performancetables/

capped point scores was equal to 101, indicating that pupils' capped point scores varied from the mean by an average of just over 100 points.

By applying the effect sizes provided in Figure 3 to the distribution of pupils' capped point scores we can compute an estimate of the improvement in attainment required from pupils in England to put them on a par with the top-performing countries, as defined in the PISA 2009 study. This is assuming improvements of this size are made in all subjects, not just reading. As each GCSE grade is worth 6 points, we can divide the required increase in pupils' capped point scores by 6 to translate this figure into the number of grades by which pupils would need to improve their top 8 GCSE qualifications. Figure 4 below shows the average increase per pupil, in terms of Key Stage 4 capped point scores and GCSE grades, required to match pupil performance in reading in each of the comparison countries scoring significantly higher than England in the reading strand[6].

Figure 4: Increase in capped point score and GCSE grades required to match pupil performance in reading, in each of the comparison countries scoring significantly higher than England in the reading strand

Comparison country[1]	Effect size	Required increase in… … Key Stage 4 capped point scores	…GCSE grades
Shanghai-China	0.6	66	11
Korea	0.5	48	8
Finland	0.4	44	7
Hong Kong-China	0.4	42	7
Singapore	0.3	34	6
Canada	0.3	32	5
New Zealand	0.3	28	5
Japan	0.3	27	5
Australia	0.2	22	4
Netherlands	0.1	15	3
Belgium	0.1	13	2
Norway	0.1	10	2
Iceland	0.1	7	1

1. Countries listed in **bold** are OECD member states.
Key Stage 4 capped point scores are reported to the nearest whole number, effect sizes to the nearest 1 decimal place.

Sources: OECD, PISA 2009 database and National Pupil Database, 2010

Pupils could achieve the increase in capped point scores in various ways: by improving their grades in all subjects or by focussing on getting the top grades in particular subjects. Figure 5 below provides some example scenarios of the increase in GCSE grades required of a pupil whose best eight GCSE or equivalent grades at the end of Key Stage 4 were eight Cs[7].

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[6] Annex D provides this information for the mathematics and science strands.
[7] Annex E provides this information for the mathematics and science strands.

Figure 5: Example scenarios showing the increase in GCSE grades required from a pupil, whose best eight grades were eight C grades, to match pupil performance in countries scoring significantly above England in the PISA 2009 reading strand

	Required increase in GCSE grades	Pupil's best 8 GCSE and equivalent qualifications							
England		C	C	C	C	C	C	C	C
Comparison country[1]									
Shanghai-China	11	A	A	A	B	B	B	B	B
Korea	8	B	B	B	B	B	B	B	B
Finland, Hong Kong-China	7	B	B	B	B	B	B	B	C
Singapore	6	B	B	B	B	B	B	C	C
Canada, New Zealand, Japan	5	B	B	B	B	B	C	C	C
Australia	4	B	B	B	B	C	C	C	C
Netherlands	3	B	B	B	C	C	C	C	C
Belgium, Norway	2	B	B	C	C	C	C	C	C
Iceland	1	B	C	C	C	C	C	C	C

1. Countries listed in **bold** are OECD member states   *Source: OECD, PISA 2009 Database*

3.2   Proportion of pupils achieving 5 A* to C including English and maths

In 2010, 55% of pupils in maintained schools in England achieved 5 or more GCSEs (or equivalents) at grade A*-C including English and mathematics. To estimate the proportion of pupils who would achieve the five A*-C threshold if pupils in England performed at the same level as the top-performing PISA 2009 countries we need to look at the likelihood of pupils achieving the threshold measure for various point scores.

Figure 6 below shows the distribution of capped point scores for pupils who were at the end of Key Stage 4 in 2010 and the proportion of pupils achieving each of the scores who also achieved 5 A*-C GCSE grades (or equivalents) including English and maths.

Figure 6: Distribution of pupils' capped point scores and the likelihood of pupils with a particular point score of achieving the threshold meausre of 5A*-C grades (including English and maths)
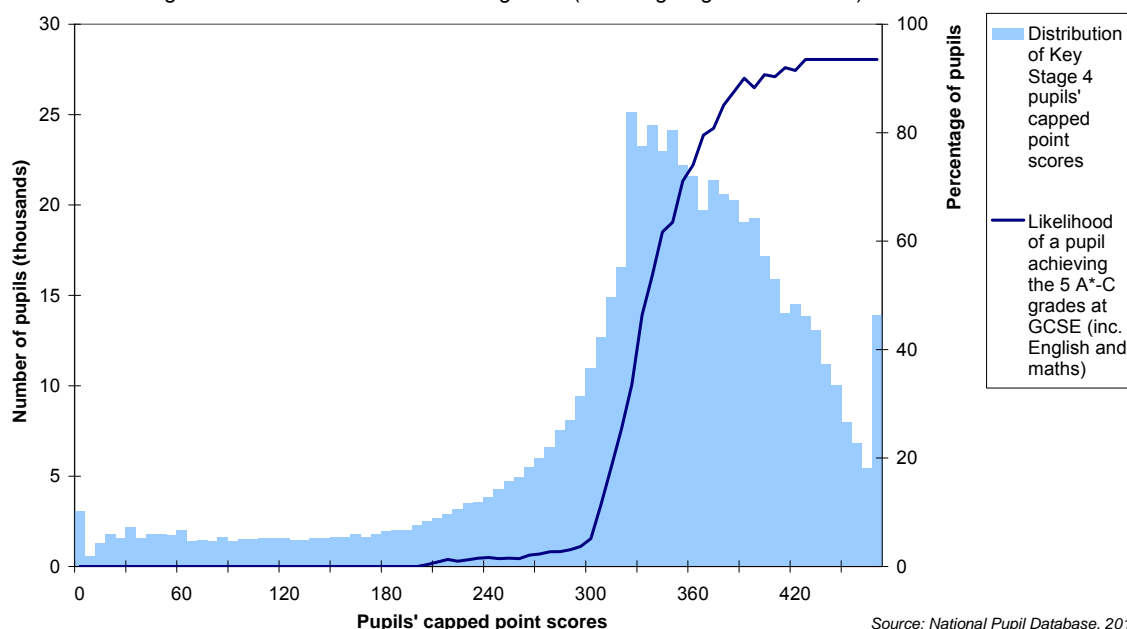
Source: National Pupil Database, 2010

Achieving 5 A*-C grades (including English and mathematics) in GCSE and equivalent qualifications implies a minimum of 200 points. However, point scores in the 200-300 range are most frequently achieved by pupils scoring eight D – F grades. Above 300 points, the probability of achieving this threshold measure increases rapidly.

To calculate how the proportion of pupils achieving the 5A* - C threshold would be affected if pupil attainment in England were to increase to match that in the top-performing countries in PISA 2009, we can shift the distribution of pupils' capped point scores by the average per pupil increases discussed in section 3.1 and reapply the probabilities to the shifted distribution.

Figure 7 shows the impact increasing pupil attainment to the levels of the top-performing countries in the 2009 PISA reading strand would have on the proportion of pupils achieving 5 A*-C grades (including English and maths) threshold measure[8].

Figure 7: Impact of increased pupil attainment on the proportion of pupils achieving 5 A*-C grades (including English and mathematics) and the comparison countries whose attainment in the PISA 2009 reading assessment we would match

Increase in pupils' Key Stage 4 capped point scores[1]	Threshold measure: Five A*-C grades including English and mathematics		Countries[2] whose attainment in the PISA 2009 reading assessment we would match
	Percentage point increase	Overall proportion of pupils achieving the threshold	
84	25%	80%	
78	24%	79%	
72	23%	78%	
66	22%	77%	Shanghai - China
60	21%	76%	
54	20%	75%	
48	18%	73%	**Korea, Finland**
42	17%	72%	Hong Kong - China
36	15%	70%	**Canada**, Singapore
30	13%	68%	**Japan, New Zealand**
24	11%	66%	**Australia**
18	8%	64%	**Belgium, Netherlands**
12	6%	61%	**Norway**, Iceland
6	3%	58%	
Proportion of pupils in maintained schools in England who achieved 5 A*-C grades including English and mathematics in 2010		55%	

1. Pupils' capped point scores were grouped into sizes as each GCSE grade is six points apart.
2. Countries listed in **bold** are OECD member states
Pupils' capped point scores and percentages are reported to the nearest whole number

Source: OECD, 2009 PISA database and National Pupil Database, 2010

4. Expressing the attainment gap in terms of years of progress

The OECD ascertain that a year's progress is equal to 40 PISA points, which is an effect size of 0.4 (40 PISA points divided by standard deviation of 100). This is derived from a number of countries who submitted results from 15 year olds split across two school grades and is based on a multi-level model that looks at the effect pupil grade has on attainment, controlling for factors such as pupil gender, socio-economic background and whether students were foreign born[9].

4.1 Definition of a year's progress using national data

We can check this assumption using what we know about our definition of a year's progress in England. At Key Stages 1-3 pupil attainment is measured in terms of National Curriculum levels. Each level is worth six points and pupils are expected to make one level of progress every two years, so pupils are expected to increase their attainment by three points each year. Looking at pupil attainment, in terms of pupil point scores, at each of the Key Stages,

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[8] See Annex F for mathematics and science strands.
[9] OECD, *PISA 2009 Results: What Students Know and Can Do*, Annex A1 p.167

we see that pupil results become more spread out as pupils get older. As can be seen from Figure 8, the spread of results at Key Stage 1 is 3.6, just over one year's progress. At Key Stage 2 the spread increases to 5.0 points (1.7 years' progress) and at Key Stage 3 this increases again to 6.7 points (2.2 years' progress).

Figure 8: Descriptive statistics of pupil point scores at Key Stages 1, 2 and 3

	Key Stage 1	Key Stage 2	Key Stage 3
Expected National Curriculum Level	**2**	**4**	**5 or 6**
in terms of pupil point scores	*15*	*27*	*36*
Average (mean) pupil point score	15.3	27.1	34.4
Standard deviation	3.6	5.0	6.7
Standard deviation expressed in terms of years of progress	1.2 years	1.7 years	2.2 years
A year's progress expressed in terms of an effect size	0.8	0.6	0.4

Source: National Pupil Database, 2010 for Key Stages 1 and 2. Due to the discontinuation of Key Stage 3 National Curriculum tests, Key Stage 3 statistics are taken from 2007.

The last row in the table above shows a year's progress as an effect size at each Key Stage. At Key Stage 1 a year's progress can be expressed as an effect size of 0.8, by Key Stage 3 this has fallen to 0.4. As the PISA assessments were carried out on 15 year olds, our estimate of a year's progress matches the OECD figure above.

4.2   Translation of a year's progress for country comparisons in PISA 2009.

Using the effect sizes outlined in figure 4 (section 2.2), which provide the effect sizes required for pupil attainment in England to match that of the top-performing countries in the PISA 2009 reading assessment, we can express the gap between England and the top-performing countries in terms of years of progress[10].

Figure 9: Attainment gap between England and the countries performing significantly better than England in the PISA 2009 reading assessment, in PISA points and years' progress

Comparison country[1]	*Effect size*	Difference in pupil attainment…	
		…in PISA points	…in years' progress
Shanghai-China	*0.6*	62	1.5
Korea	*0.5*	45	1.1
Finland	*0.4*	42	1.0
Hong Kong-China	*0.4*	39	0.9
Singapore	*0.3*	32	0.7
Canada	*0.3*	30	0.7
New Zealand	*0.3*	27	0.6
Japan	*0.3*	26	0.6
Australia	*0.2*	21	0.5
Netherlands	*0.1*	14	0.3
Belgium	*0.1*	12	0.3
Norway	*0.1*	9	0.2
Iceland	*0.1*	6	0.1

1. Countries listed in **bold** are OECD member states
PISA points are reported to the nearest whole number, years progress and effect sizes to 1 decimal place
Source: OECD, PISA 2009 Database & additional DfE analysis

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[10] Annex G provides the same information for the mathematics and science strands of the PISA 2009 assessment.

5.   Summary

In summary, by expressing the improvement required from pupils in England to match the attainment of countries performing significantly above England in the 2009 PISA assessment in terms of effect sizes, we can portray the attainment gap between England and comparison countries in the PISA 2009 reading assessment using measures of attainment used nationally. Figure 10 below provides a summary table containing all the measures discussed in the note.

Figure 10: Attainment gap between England and the countries performing significantly better than England in the PISA 2009 reading assessment expressed using various measures of attainment

Comparison Country[1]	Effect size	…in PISA points	…in KS4 capped point scores	…in GCSE grades	…in % pupils achieving 5 A*-C (inc. English and Maths)	…in years' progress
			Reading strand Difference in pupil attainment…			
Shanghai – China	0.6	62	66	11	22%	1.5
Korea	0.5	45	48	8	18%	1.1
Finland	0.4	42	44	7	17%	1.0
Hong Kong – China	0.4	39	42	7	16%	0.9
Singapore	0.3	32	34	6	14%	0.7
Canada	0.3	30	32	5	13%	0.7
New Zealand	0.3	27	28	5	12%	0.6
Japan	0.3	26	27	5	11%	0.6
Australia	0.2	21	22	4	10%	0.5
Netherlands	0.1	14	15	3	7%	0.3
Belgium	0.1	12	13	2	6%	0.3
Norway	0.1	9	10	2	5%	0.2
Iceland	0.1	6	7	1	3%	0.1

1. Countries listed in **bold** are OECD member states

Source: OECD, PISA 2009 Database & additional DfE analysis (shaded sections)

Annex A: Distributions of the levels obtained by pupils in England in the PISA 2009 assessments compared to the average across the OECD countries

Reading

Figure A1: Difference between the distributions of pupils' <u>reading</u> scores in England and the OECD average, PISA 2009

Source: OECD, PISA 2009 Database
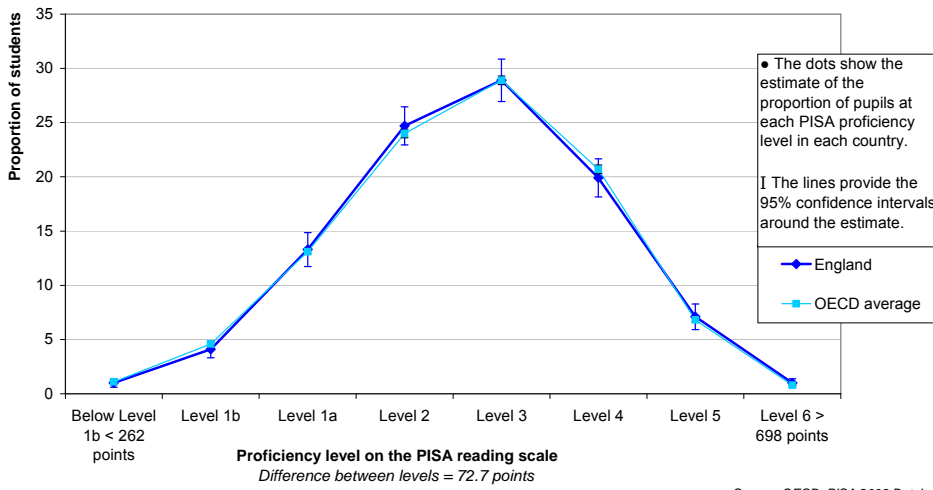
The proportion of pupils in England achieving each of the PISA attainment levels in reading matches that of the OECD average.

Mathematics

Figure A2: Difference between the distributions of pupils' <u>mathematics</u> scores in England and the OECD average, PISA 2009

Source: OECD, PISA 2009 Database
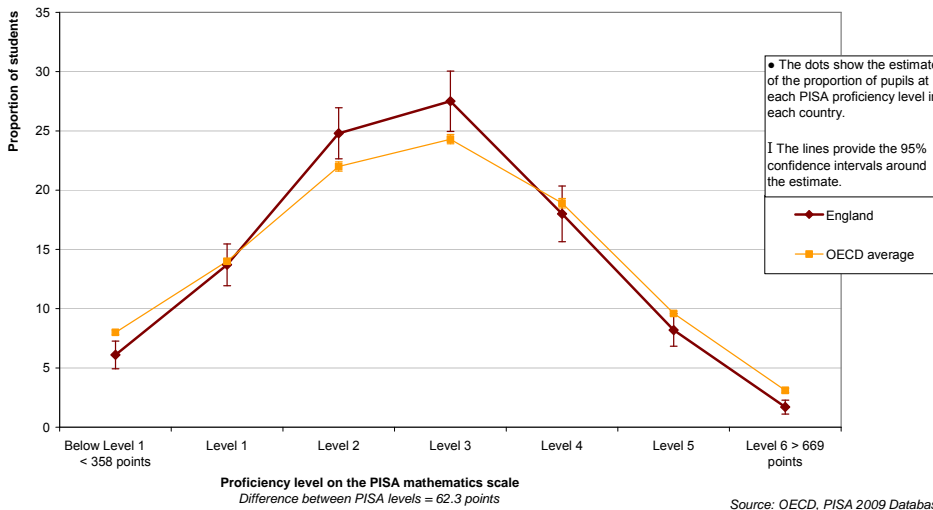
The distribution of pupils' scores in the mathematics assessment in England is slightly narrower than the OECD average; a significantly higher proportion of pupils achieved PISA levels 2 and 3 and slightly fewer achieved the levels at each end of the scale.

Science

Figure A3: Difference between the distributions of pupils' <u>science</u> scores in England and the OECD average, PISA 2009

Source: OECD, PISA 2009 Database
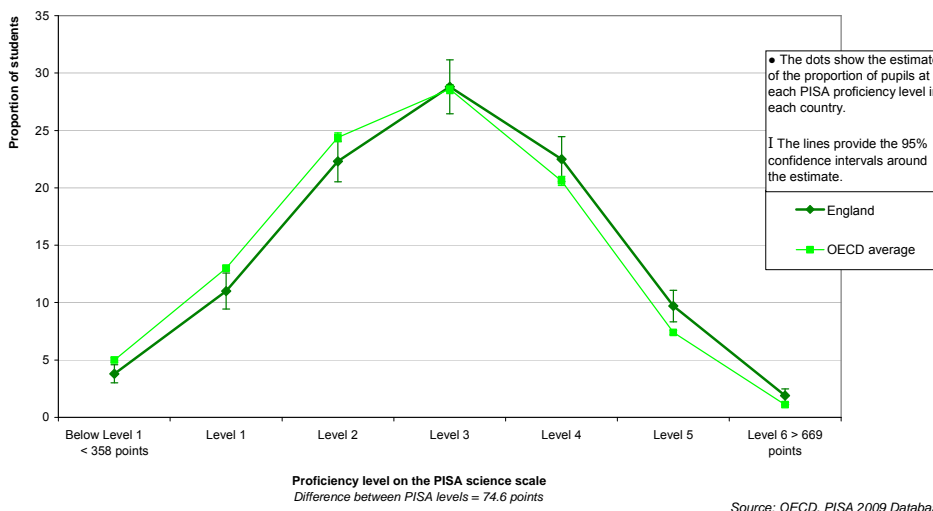
A slightly higher proportion of pupils in England achieved PISA levels 4, 5 and 6 in science compared to pupils across all participating OECD countries. The higher proportion is only significantly different at PISA level 5, as can be seen by the non-overlapping confidence intervals at this level.

Annex B: Gap between England and the top-performing countries in the PISA 2009 assessment, in terms of PISA points

Reading

Figure B1: Gap between pupils' average scores in the reading assessment in England and the top performing countries in the reading strand, PISA 2009

Source: OECD, PISA 2009 Database
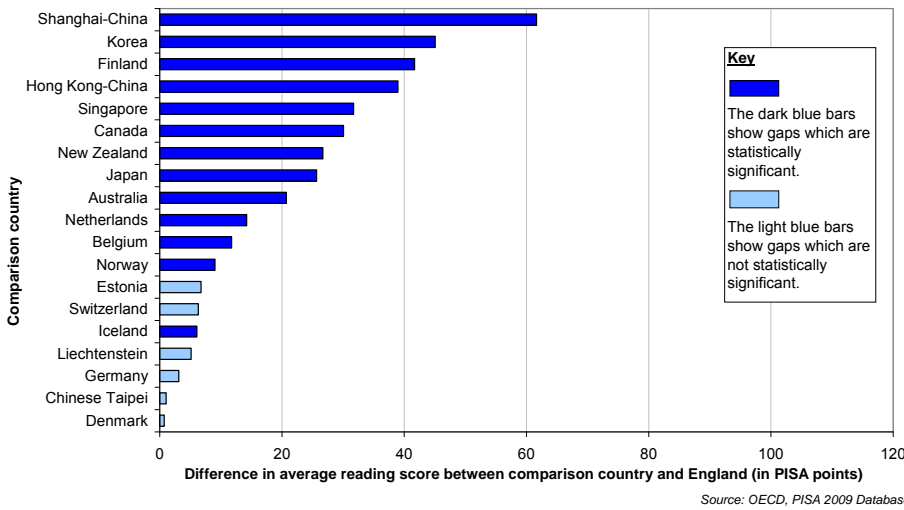
In 13 of the countries scoring higher than England in the reading assessment, the gap between pupils' average scores was statistically significant (as shown by the dark blue bars in the chart).

The largest gap in pupils' average score was between England and Shanghai-China (over 60 PISA points).

Mathematics

Figure B2: Gap between pupils' average scores in the mathematics assessment in England and the top performing countries in the mathematics strand, PISA 2009

Source: OECD, PISA 2009 Database
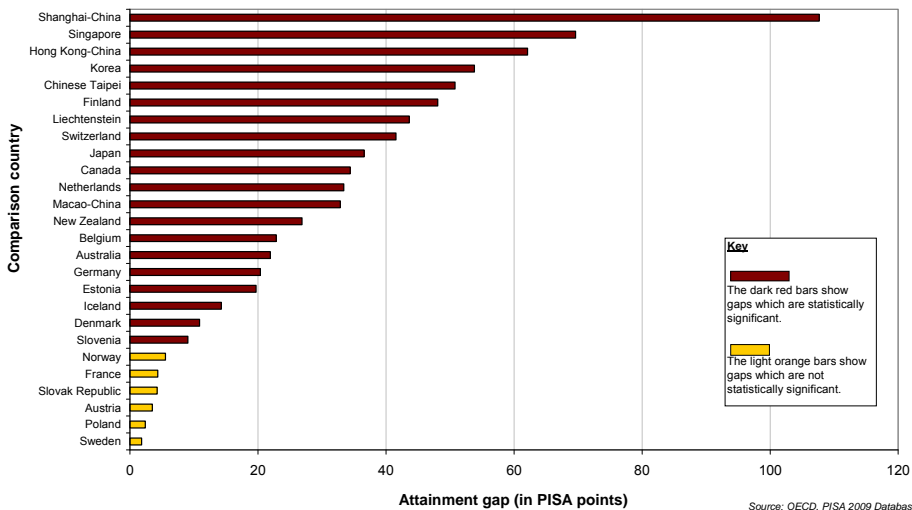
In the mathematics assessment 26 countries scored higher than England, 20 significantly so.

The size of the attainment gaps in mathematics were larger than the other strands, in particular the gap between the average score of pupils in Shanghai-China compared to that in England was greater   than 100 PISA points.

Science

Figure B3: Gap between pupils' average scores in the science assessment in England and the top performing countries in the science strand, PISA 2009

Source: OECD, PISA 2009 Database
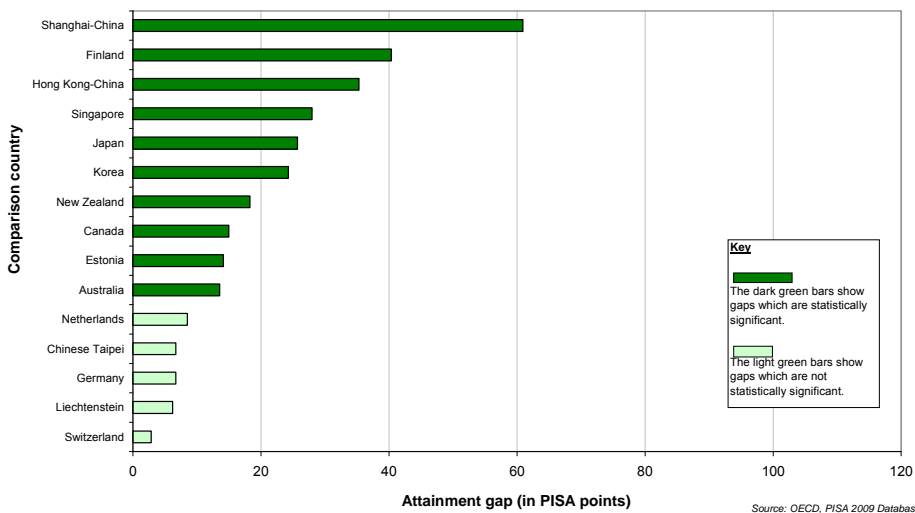
Fewer countries scored higher than England in the science assessment than in the other PISA strands. Of the 15 who did, the gap in average points scored was statistically significant in 10 countries.

Annex C: Differences in average score, in PISA points and effect sizes, between England and comparison countries

Figure C1: Difference[1] in average scores, in PISA points, between England and the countries performing significantly better than England in PISA 2009 and corresponding effect sizes

| Comparison country[2]	Reading strand		Mathematics strand		Science strand	
	Difference in average pupil score (PISA points)	*Effect size*	Difference in average pupil score (PISA points)	*Effect size*	Difference in average pupil score (PISA points)	*Effect size*
Shanghai-China	62	*0.6*	108	*1.1*	61	*0.6*
Korea	45	*0.5*	54	*0.6*	24	*0.3*
Finland	42	*0.4*	48	*0.5*	40	*0.4*
Hong Kong-China	39	*0.4*	62	*0.7*	35	*0.4*
Singapore	32	*0.3*	70	*0.7*	28	*0.3*
Canada	30	*0.3*	34	*0.4*	15	*0.2*
New Zealand	27	*0.3*	27	*0.3*	18	*0.2*
Japan	26	*0.3*	37	*0.4*	26	*0.3*
Australia	21	*0.2*	22	*0.2*	14	*0.1*
Netherlands	14	*0.1*	33	*0.4*	9	*0.1*
Belgium	12	*0.1*	23	*0.2*	-	-
Norway	9	*0.1*	6	*0.1*	-	-
Estonia	7	*0.1*	20	*0.2*	14	*0.1*
Switzerland	6	*0.1*	42	*0.4*	3	*0.0*
Iceland	6	*0.1*	14	*0.2*	-	-
Liechtenstein	5	*0.1*	44	*0.5*	6	*0.1*
Germany	3	*0.0*	20	*0.2*	7	*0.1*
Chinese Taipei	1	*0.0*	51	*0.5*	7	*0.1*
Denmark	1	*0.0*	11	*0.1*	-	-
Macao-China	-	-	33	*0.3*	-	-

1. Shaded cells indicate the gap between England's average score and that of the comparison country is statistically significant.
2. Countries are listed in descending order by size of the attainment gap in reading. Those listed in **bold** are OECD member states.
- Average score was not higher than England's in this strand.

Source: OECD, PISA 2009 Database

Annex D: Required increase in pupils' capped point scores to match pupil performance in the comparison countries

Figure D1: Increase in Key Stage 4 capped points score required to match pupil performance, in each of the comparison countries scoring significantly[1] higher than England in PISA 2009

Comparison country[2]	Reading strand		Mathematics strand		Science strand	
	Effect size	**Required increase in Key Stage 4 capped points scores**	*Effect size*	**Required increase in Key Stage 4 capped points scores**	*Effect size*	**Required increase in Key Stage 4 capped points scores**
Shanghai-China	*0.6*	66	*1.1*	115	*0.6*	65
Korea	*0.5*	48	*0.6*	57	*0.3*	26
Finland	*0.4*	44	*0.5*	51	*0.4*	43
Hong Kong-China	*0.4*	42	*0.7*	66	*0.4*	38
Singapore	*0.3*	34	*0.7*	74	*0.3*	30
Canada	*0.3*	32	*0.4*	37	*0.2*	16
New Zealand	*0.3*	28	*0.3*	29	*0.2*	20
Japan	*0.3*	27	*0.4*	39	*0.3*	27
Australia	*0.2*	22	*0.2*	23	*0.1*	14
Netherlands	*0.1*	15	*0.4*	36	*0.1*	9
Belgium	*0.1*	13	*0.2*	24	-	-
Norway	*0.1*	10	*0.1*	6	-	-
Estonia	*0.1*	7	*0.2*	21	*0.1*	15
Switzerland	*0.1*	7	*0.4*	44	*0.0*	3
Iceland	*0.1*	7	*0.2*	15	-	-
Liechtenstein	*0.1*	5	*0.5*	47	*0.1*	7
Germany	*0.0*	3	*0.2*	22	*0.1*	7
Chinese Taipei	*0.0*	1	*0.5*	54	*0.1*	7
Denmark	*0.0*	1	*0.1*	12	-	-
Macao-China	-	-	*0.3*	35	-	-

1. Shaded cells indicate the gap between England's average score and that of the comparison country is statistically significant.
2. Countries are listed in descending order by size of the attainment gap in reading. Those listed in **bold** are OECD member states.
- Average score was not higher than England's in this strand.

Source: OECD, PISA 2009 Database

Annex E: Example scenarios of the improvement in GCSE grades required from a pupil whose best eight grades at the end of Key Stage 4 are eight Cs to match pupil attainment in the top-performing countries in PISA 2009.

Figure E1: Example scenarios of the increase in GCSE grades required from a pupil, whose best eight grades were eight C grades, to match pupil performance in the PISA 2009 top-performing countries in the mathematics strand.

	Increase required in GCSE grades	Grades obtained in pupil's best eight GCSE or equivalent qualifications							
England		C	C	C	C	C	C	C	C
Comparison country[1]									
Shanghai-China	19	A*	A*	A*	A	A	A	A	A
Singapore	12	A	A	A	A	B	B	B	B
Hong Kong-China	11	A	A	A	B	B	B	B	B
Korea	10	A	A	B	B	B	B	B	B
Chinese Taipei, **Finland**	9	A	B	B	B	B	B	B	B
Liechtenstein	8	B	B	B	B	B	B	B	B
Switzerland, Japan	7	B	B	B	B	B	B	B	C
Canada, Netherlands, Macao-China	6	B	B	B	B	B	B	C	C
New Zealand	5	B	B	B	B	B	C	C	C
Belgium, Australia, Germany, Estonia	4	B	B	B	B	C	C	C	C
Iceland	3	B	B	B	C	C	C	C	C
Denmark, Slovenia	2	B	B	C	C	C	C	C	C

1. Countries listed in **bold** are OECD member states

Source: OECD, PISA 2009 Database

Figure E2: Example scenarios of the increase in GCSE grades required from a pupil, whose best 8 grades were eight C grades, to match pupil performance in the PISA 2009 top-performing countries in the science strand.

	Increase required in GCSE grades	Grades obtained in pupil's best eight GCSE or equivalent qualifications							
England		C	C	C	C	C	C	C	C
Comparison country[1]									
Shanghai-China	11	A	A	A	B	B	B	B	B
Finland	7	B	B	B	B	B	B	B	C
Hong Kong-China	6	B	B	B	B	B	B	C	C
Singapore, **Japan**	5	B	B	B	B	B	C	C	C
Korea	4	B	B	B	B	C	C	C	C
New Zealand, Canada, Estonia	3	B	B	B	C	C	C	C	C
Australia	2	B	B	C	C	C	C	C	C

1. Countries listed in **bold** are OECD member states

Source: OECD, PISA 2009 Database

Annex F: Impact of increasing pupil attainment to the levels of the top-performing countries in the 2009 PISA strands on the proportion of pupils achieving 5 A*-C grades (including English and maths) threshold measure

Figure F1: Impact of increased pupil attainment on the proportion of pupils achieving 5 A*-C grades (including English and mathematics) and the comparison countries whose attainment we would match were we to achieve each level of increase

Increase in pupils' Key Stage 4 capped point scores[1]	Percentage point increase	Proportion of pupils achieving 5 A*-C including English and mathematics	Top-performing countries[2] whose attainment in the PISA 2009 assessment we would match		
			Reading strand	Mathematics strand	Science strand
120	29%	84%		Shanghai-China	
114	28%	84%			
108	28%	83%			
102	27%	82%			
96	27%	82%			
90	26%	81%			
84	25%	80%			
78	24%	79%		Singapore	
72	23%	78%			
66	22%	77%	Shanghai-China	Hong Kong- China	Shanghai-China
60	21%	76%		**Korea**	
54	20%	75%		**Finland,** Chinese Taipei	
48	18%	73%	**Korea, Finland**	Liechtenstein, **Switzerland**	**Finland**
42	17%	72%	Hong Kong- China	**Canada, Japan**	Hong Kong- China
36	15%	70%	**Canada**, Singapore	**Macao - China, Netherlands**	
30	13%	68%	**Japan, New Zealand**	**New Zealand**	**Japan,** Singapore, **Korea**
24	11%	66%	**Australia**	**Germany, Estonia, Belgium, Australia**	**New Zealand**
18	8%	64%	**Belgium, Netherlands**	**Iceland**	**Estonia, Australia, Canada**
12	6%	61%	**Norway, Iceland**	**Slovenia, Denmark**	
6	3%	58%			
2010 figure for maintained schools in England:		55%			

1. Pupils' capped point scores were grouped into sixes as each GCSE grade is six points apart.
2. Countries listed in **bold** are OECD member states.
Capped GCSE point scores and percentages are reported to the nearest whole number.

Source: OECD, PISA 2009 Database and National Pupil Database 2010.

Annex G: Attainment gap between England and the top-performing countries in the 2009 PISA strands expressed in terms of years of progress.

Figure G1: Attainment gap between England and the countries performing significantly[1] better than England in the PISA 2009 assessments expressed in terms of: PISA points, effect size and years progress

Comparison country[2]	Reading strand Attainment gap…			Mathematics strand Attainment gap…			Science strand Attainment gap…		
	Effect size	…in PISA points	…in years' progress	*Effect size*	…in PISA points	…in years' progress	*Effect size*	…in PISA points	…in years' progress
Shanghai-China	*0.6*	62	1.5	*1.1*	108	2.5	*0.6*	61	1.4
Korea	*0.5*	45	1.1	*0.6*	54	1.3	*0.3*	24	0.6
Finland	*0.4*	42	1.0	*0.5*	48	1.1	*0.4*	40	0.9
Hong Kong-China	*0.4*	39	0.9	*0.7*	62	1.5	*0.4*	35	0.8
Singapore	*0.3*	32	0.7	*0.7*	70	1.6	*0.3*	28	0.7
Canada	*0.3*	30	0.7	*0.4*	34	0.8	*0.2*	15	0.4
New Zealand	*0.3*	27	0.6	*0.3*	27	0.6	*0.2*	18	0.4
Japan	*0.3*	26	0.6	*0.4*	37	0.9	*0.3*	26	0.6
Australia	*0.2*	21	0.5	*0.2*	22	0.5	*0.1*	14	0.3
Netherlands	*0.1*	14	0.3	*0.4*	33	0.8	*0.1*	9	0.2
Belgium	*0.1*	12	0.3	*0.2*	23	0.5	-	-	-
Norway	*0.1*	9	0.2	*0.1*	6	0.1	-	-	-
Estonia	*0.1*	7	0.2	*0.2*	20	0.5	*0.1*	14	0.3
Switzerland	*0.1*	6	0.1	*0.4*	42	1.0	*0.0*	3	0.1
Iceland	*0.1*	6	0.1	*0.2*	14	0.3	-	-	-
Liechtenstein	*0.1*	5	0.1	*0.5*	44	1.0	*0.1*	6	0.1
Germany	*0.0*	3	0.1	*0.2*	20	0.5	*0.1*	7	0.2
Chinese Taipei	*0.0*	1	0.0	*0.5*	51	1.2	*0.1*	7	0.2
Denmark	*0.0*	1	0.0	*0.1*	11	0.3	-	-	-
Macao-China	-	-	-	*0.3*	33	0.8	-	-	-
Slovenia	-	-	-	*0.1*	9	0.2	-	-	-

1. Shaded cells indicate the gap between England's average score and that of the comparison country is statistically significant.
2. Countries are listed in descending order by size of attainment gap in the reading assessment, those listed in **bold** are OECD member states.
- Average score was not higher than England's in this strand.

Source: OECD, PISA 2009 Database and National Pupil Database 2010

Annex H:

Figure H1: Mean score, standard deviation, ranking and statistically significant differences between countries on the reading scale

Country[1]	Mean score		Standard deviation		Ranking		Countries whose mean score is NOT statistically significantly different from that of the listed country	Comparison of country's score with OECD average
	Mean	S.E.	S.D.	S.E.	Upper rank	Lower rank		
Shanghai-China	556	(2.4)	80	(1.7)	1	1		
Korea	539	(3.5)	79	(2.1)	2	4	Finland, Hong Kong-China	
Finland	536	(2.3)	86	(1.0)	2	4	Korea, Hong Kong-China	
Hong Kong-China	533	(2.1)	84	(1.7)	3	4	Korea, Finland	
Singapore	526	(1.1)	97	(1.0)	5	6	Canada, New Zealand, Japan	
Canada	524	(1.5)	90	(0.9)	5	7	Singapore, New Zealand, Japan	
New Zealand	521	(2.4)	103	(1.7)	6	9	Singapore, Canada, Japan, Australia	
Japan	520	(3.5)	100	(2.9)	5	9	Singapore, Canada, New Zealand, Australia, Netherlands	
Australia	515	(2.3)	99	(1.4)	8	10	New Zealand, Japan, Netherlands	Statistically significantly **above** the OECD average
Netherlands	508	(5.1)	89	(1.6)	8	16	Japan, Australia, Belgium, Norway, Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany	
Belgium	506	(2.3)	102	(1.7)	10	14	Netherlands, Norway, Estonia, Switzerland, Poland, United States, Liechtenstein	
Norway	503	(2.6)	91	(1.2)	10	18	Netherlands, Belgium, Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France	
Estonia	501	(2.6)	83	(1.7)	11	21	Netherlands, Belgium, Norway, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary ,	
Switzerland	501	(2.4)	93	(1.4)	11	21	Netherlands, Belgium, Norway, Estonia, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary ,	
Poland	500	(2.6)	89	(1.3)	11	22	Netherlands, Belgium, Norway, Estonia, Switzerland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary ,	
Iceland	500	(1.4)	96	(1.2)	12	19	Netherlands, Norway, Estonia, Switzerland, Poland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Hungary	
United States	500	(3.7)	97	(1.6)	11	25	Netherlands, Belgium, Norway, Estonia, Switzerland, Poland, Iceland, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary	
Liechtenstein	499	(2.8)	83	(3.5)	11	23	Netherlands, Belgium, Norway, Estonia, Switzerland, Poland, Iceland, United States, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary	
Sweden	497	(2.9)	99	(1.5)	13	26	Netherlands, Norway, Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary, Portugal	
Germany	497	(2.7)	95	(1.8)	14	26	Netherlands, Norway, Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary	
Ireland	496	(3.0)	95	(2.2)	15	27	Norway, Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, France, Chinese Taipei, Denmark, United Kingdom, ~~Hungary, Portugal~~	Not statistically significantly different from the OECD average
France	496	(3.4)	106	(2.8)	14	27	Norway, Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, Chinese Taipei, Denmark, United Kingdom, Hungary,	
Chinese Taipei	495	(2.6)	86	(1.9)	17	27	Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Denmark, United Kingdom, Hungary, Portugal	
Denmark	495	(2.1)	84	(1.2)	18	26	Estonia, Switzerland, Poland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, United Kingdom, Hungary, Portugal	
England	495	(2.8)	95	(1.4)	19	27	Estonia, Switzerland, Poland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, Hungary, Portugal	
Hungary	494	(3.2)	90	(2.4)	16	27	Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Portugal	
Portugal	489	(3.1)	87	(1.6)	23	31	Sweden, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary, Macao-China, Italy, Latvia, Slovenia, Greece	
Macao-China	487	(0.9)	76	(0.8)	27	30	Portugal, Italy, Latvia, Greece	
Italy	486	(1.6)	96	(1.4)	27	31	Portugal, Macao-China, Latvia, Slovenia, Greece, Spain	
Latvia	484	(3.0)	80	(1.5)	27	34	Portugal, Macao-China, Italy, Slovenia, Greece, Spain, Czech Republic, Slovak Republic	
Slovenia	483	(1.0)	91	(0.9)	30	33	Portugal, Italy, Latvia, Greece, Spain, Czech Republic	
Greece	483	(4.3)	95	(2.4)	27	37	Portugal, Macao-China, Italy, Latvia, Slovenia, Spain, Czech Republic, Slovak Republic, Croatia, Israel	
Spain	481	(2.0)	88	(1.1)	30	35	Italy, Latvia, Slovenia, Greece, Czech Republic, Slovak Republic, Croatia, Israel	
Czech Republic	478	(2.9)	92	(1.6)	31	37	Latvia, Slovenia, Greece, Spain, Slovak Republic, Croatia, Israel, Luxembourg,	
Slovak Republic	477	(2.5)	90	(1.9)	32	37	Latvia, Greece, Spain, Czech Republic, Croatia, Israel, Luxembourg, Austria	
Croatia	476	(2.9)	88	(1.6)	33	39	Greece, Spain, Czech Republic, Slovak Republic, Israel, Luxembourg, Austria, Lithuania	
Israel	474	(3.6)	112	(2.7)	33	40	Greece, Spain, Czech Republic, Slovak Republic, Croatia, Luxembourg, Austria, Lithuania, Turkey	
Luxembourg	472	(1.3)	104	(0.9)	36	39	Czech Republic, Slovak Republic, Croatia, Israel, Austria, Lithuania	
Austria	470	(2.9)	100	(2.0)	36	41	Czech Republic, Slovak Republic, Croatia, Israel, Luxembourg, Lithuania, Turkey	
Lithuania	468	(2.4)	86	(1.6)	38	41	Croatia, Israel, Luxembourg, Austria, Turkey	
Turkey	464	(3.5)	82	(1.7)	39	43	Israel, Austria, Lithuania, Dubai (UAE), Russian Federation	Statistically significantly **below** the OECD average
Dubai (UAE)	459	(1.1)	107	(0.9)	41	43	Turkey, Russian Federation	
Russian Federation	459	(3.3)	90	(2.0)	41	43	Turkey, Dubai (UAE)	
Chile	449	(3.1)	83	(1.7)	44	44	Serbia	
Serbia	442	(2.4)	84	(1.5)	45	46	Chile, Bulgaria	
Bulgaria	429	(6.7)	113	(2.5)	45	50	Serbia, Uruguay, Mexico, Romania, Thailand, Trinidad and Tobago	
Uruguay	426	(2.6)	99	(1.9)	46	50	Bulgaria, Mexico, Romania, Thailand	
Mexico	425	(2.0)	85	(1.2)	46	49	Bulgaria, Uruguay, Romania, Thailand	
Romania	424	(4.1)	90	(2.3)	46	50	Bulgaria, Uruguay, Mexico, Thailand, Trinidad and Tobago	
Thailand	421	(2.6)	72	(1.9)	47	51	Bulgaria, Uruguay, Mexico, Romania, Trinidad and Tobago, Colombia	
Trinidad and Tobago	416	(1.2)	113	(1.3)	50	52	Bulgaria, Romania, Thailand, Colombia, Brazil	
Colombia	413	(3.7)	87	(1.9)	50	55	Thailand, Trinidad and Tobago, Brazil, Montenegro, Jordan	
Brazil	412	(2.7)	94	(1.5)	51	54	Trinidad and Tobago, Colombia, Montenegro, Jordan	
Montenegro	408	(1.7)	93	(1.1)	53	56	Colombia, Brazil, Jordan, Tunisia, Indonesia, Argentina	
Jordan	405	(3.3)	91	(2.0)	53	58	Colombia, Brazil, Montenegro, Tunisia, Indonesia, Argentina	
Tunisia	404	(2.9)	85	(1.8)	54	58	Montenegro, Jordan, Indonesia, Argentina	
Indonesia	402	(3.7)	66	(2.0)	54	58	Montenegro, Jordan, Tunisia, Argentina	
Argentina	398	(4.6)	108	(3.4)	55	59	Montenegro, Jordan, Tunisia, Indonesia, Kazakhstan	
Kazakhstan	390	(3.1)	91	(1.6)	58	60	Argentina, Albania	
Albania	385	(4.0)	100	(1.9)	59	60	Kazakhstan, Panama	
Qatar	372	(0.8)	115	(0.8)	61	63	Panama, Peru	
Panama	371	(6.5)	99	(3.5)	61	64	Albania, Qatar, Peru, Azerbaijan	
Peru	370	(4.0)	98	(2.4)	61	64	Qatar, Panama, Azerbaijan	
Azerbaijan	362	(3.3)	76	(1.8)	63	64	Panama, Peru	
Kyrgyzstan	314	(3.2)	99	(2.1)	65	65		

1. Countries listed in **bold** are OECD member states

Source: OECD, PISA 2009 Database

Figure H2: Mean score, standard deviation, ranking and statistically significant differences between countries on the mathematics scale

Country	Mean score		Standard deviation		Ranking		Countries whose mean score is NOT statistically significantly different from that of the listed country	Comparison of country's score with OECD average
	Mean	S.E.	S.D.	S.E.	Upper rank	Lower rank		
Shanghai-China	600	(2.8)	103	(2.1)	1	1		Statistically significantly **above** the OECD average
Singapore	562	(1.4)	104	(1.2)	2	2		
Hong Kong-China	555	(2.7)	95	(1.8)	3	4	Korea	
Korea	546	(4.0)	89	(2.5)	3	6	Hong Kong-China, Chinese Taipei, Finland, Liechtenstein	
Chinese Taipei	543	(3.4)	105	(2.3)	4	7	Korea, Finland, Liechtenstein, Switzerland	
Finland	541	(2.2)	82	(1.1)	4	7	Korea, Chinese Taipei, Liechtenstein, Switzerland	
Liechtenstein	536	(4.1)	88	(4.4)	5	9	Korea, Chinese Taipei, Finland, Switzerland, Japan, Netherlands	
Switzerland	534	(3.3)	99	(1.6)	6	9	Chinese Taipei, Finland, Liechtenstein, Japan, Canada, Netherlands	
Japan	529	(3.3)	94	(2.2)	8	12	Liechtenstein, Switzerland, Canada, Netherlands, Macao-China	
Canada	527	(1.6)	88	(1.0)	9	12	Switzerland, Japan, Netherlands, Macao-China	
Netherlands	526	(4.7)	89	(1.7)	8	13	Liechtenstein, Switzerland, Japan, Canada, Macao-China, New Zealand	
Macao-China	525	(0.9)	85	(0.9)	10	12	Japan, Canada, Netherlands	
New Zealand	519	(2.3)	96	(1.6)	12	14	Netherlands, Belgium, Australia, Germany	
Belgium	515	(2.3)	104	(1.8)	13	17	New Zealand, Australia, Germany, Estonia	
Australia	514	(2.5)	94	(1.4)	13	17	New Zealand, Belgium, Germany, Estonia	
Germany	513	(2.9)	98	(1.7)	13	17	New Zealand, Belgium, Australia, Estonia, Iceland	
Estonia	512	(2.6)	81	(1.6)	14	17	Belgium, Australia, Germany, Iceland	
Iceland	507	(1.4)	91	(1.2)	17	19	Germany, Estonia, Denmark	
Denmark	503	(2.6)	87	(1.3)	18	21	Iceland, Slovenia, Norway, France, Slovak Republic	
Slovenia	501	(1.2)	95	(0.9)	19	21	Denmark, Norway, France, Slovak Republic, Austria	
Norway	498	(2.4)	85	(1.2)	19	26	Denmark, Slovenia, France, Slovak Republic, Austria, Poland, Sweden, Czech Republic, United Kingdom, Hungary	Not statistically significantly different from the OECD average
France	497	(3.1)	101	(2.1)	19	28	Denmark, Slovenia, Norway, Slovak Republic, Austria, Poland, Sweden, Czech Republic, United Kingdom, Hungary	
Slovak Republic	497	(3.1)	96	(2.4)	19	28	Denmark, Slovenia, Norway, France, Austria, Poland, Sweden, Czech Republic, United Kingdom, Hungary	
Austria	496	(2.7)	96	(2.0)	20	28	Slovenia, Norway, France, Slovak Republic, Poland, Sweden, Czech Republic, United Kingdom, Hungary, United States	
Poland	495	(2.8)	88	(1.4)	21	29	Norway, France, Slovak Republic, Austria, Sweden, Czech Republic, United Kingdom, Hungary, Luxembourg, United States, Portugal	
Sweden	494	(2.9)	94	(1.3)	21	30	Norway, France, Slovak Republic, Austria, Poland, Czech Republic, United Kingdom, Hungary, Luxembourg, United States, Ireland, Portugal	
Czech Republic	493	(2.8)	93	(1.8)	22	31	Norway, France, Slovak Republic, Austria, Poland, Sweden, United Kingdom, Hungary, Luxembourg, United States, Ireland, Portugal	
England	493	(2.9)	87	(1.5)	23	31	Norway, France, Slovak Republic, Austria, Poland, Sweden, Czech Republic, Hungary, Luxembourg, United States, Ireland, Portugal	
Hungary	490	(3.5)	92	(2.8)	23	34	Norway, France, Slovak Republic, Austria, Poland, Sweden, Czech Republic, United Kingdom, Luxembourg, United States, Ireland, Portugal, Spain, Italy, Latvia	
Luxembourg	489	(1.2)	98	(1.2)	28	33	Poland, Sweden, Czech Republic, United Kingdom, Hungary, United States, Ireland, Portugal	Statistically significantly **below** the OECD average
United States	487	(3.6)	91	(1.6)	26	36	Austria, Poland, Sweden, Czech Republic, United Kingdom, Hungary, Luxembourg, Ireland, Portugal, Spain, Italy, Latvia	
Ireland	487	(2.5)	86	(1.6)	28	35	Sweden, Czech Republic, United Kingdom, Hungary, Luxembourg, United States, Portugal, Spain, Italy, Latvia	
Portugal	487	(2.9)	91	(1.5)	28	36	Poland, Sweden, Czech Republic, United Kingdom, Hungary, Luxembourg, United States, Ireland, Spain, Italy, Latvia	
Spain	483	(2.1)	91	(1.1)	32	36	Hungary, United States, Ireland, Portugal, Italy, Latvia	
Italy	483	(1.9)	93	(1.7)	32	36	Hungary, United States, Ireland, Portugal, Spain, Latvia	
Latvia	482	(3.1)	79	(1.4)	32	37	Hungary, United States, Ireland, Portugal, Spain, Italy, Lithuania	
Lithuania	477	(2.6)	88	(1.8)	36	38	Latvia	
Russian Federation	468	(3.3)	85	(2.1)	38	39	Greece, Croatia	
Greece	466	(3.9)	89	(2.0)	38	40	Russian Federation, Croatia	
Croatia	460	(3.1)	88	(1.8)	39	40	Russian Federation, Greece	
Dubai (UAE)	453	(1.1)	99	(0.9)	41	42	Israel, Turkey	
Israel	447	(3.3)	104	(2.4)	42	44	Dubai (UAE), Turkey, Serbia	
Turkey	445	(4.4)	93	(3.0)	41	44	Dubai (UAE), Israel, Serbia	
Serbia	442	(2.9)	91	(1.9)	42	44	Israel, Turkey	
Azerbaijan	431	(2.8)	64	(2.2)	45	47	Bulgaria, Romania, Uruguay	
Bulgaria	428	(5.9)	99	(2.8)	45	51	Azerbaijan, Romania, Uruguay, Chile, Thailand, Mexico	
Romania	427	(3.4)	79	(2.1)	45	49	Azerbaijan, Bulgaria, Uruguay, Chile, Thailand	
Uruguay	427	(2.6)	91	(1.7)	45	49	Azerbaijan, Bulgaria, Romania, Chile	
Chile	421	(3.1)	80	(1.7)	47	51	Bulgaria, Romania, Uruguay, Thailand, Mexico	
Thailand	419	(3.2)	79	(2.5)	48	52	Bulgaria, Romania, Chile, Mexico, Trinidad and Tobago	
Mexico	419	(1.8)	79	(1.1)	49	51	Bulgaria, Chile, Thailand	
Trinidad and Tobago	414	(1.3)	99	(1.2)	51	52	Thailand	
Kazakhstan	405	(3.0)	83	(2.3)	53	54	Montenegro	
Montenegro	403	(2.0)	85	(1.5)	53	54	Kazakhstan	
Argentina	388	(4.1)	93	(2.9)	55	58	Jordan, Brazil, Colombia, Albania	
Jordan	387	(3.7)	83	(2.6)	55	58	Argentina, Brazil, Colombia, Albania	
Brazil	386	(2.4)	81	(1.6)	55	58	Argentina, Jordan, Colombia, Albania	
Colombia	381	(3.2)	75	(1.7)	56	59	Argentina, Jordan, Brazil, Albania, Indonesia	
Albania	377	(4.0)	91	(2.2)	57	61	Argentina, Jordan, Brazil, Colombia, Tunisia, Indonesia	
Tunisia	371	(3.0)	78	(2.3)	59	63	Albania, Indonesia, Qatar, Peru, Panama	
Indonesia	371	(3.7)	70	(2.3)	59	63	Colombia, Albania, Tunisia, Qatar, Peru, Panama	
Qatar	368	(0.7)	98	(0.9)	61	63	Tunisia, Indonesia, Peru, Panama	
Peru	365	(4.0)	90	(2.4)	61	64	Tunisia, Indonesia, Qatar, Panama	
Panama	360	(5.2)	81	(3.2)	62	64	Tunisia, Indonesia, Qatar, Peru	
Kyrgyzstan	331	(2.9)	81	(2.1)	65	65		

1. Countries listed in **bold** are OECD member states

Source: OECD, PISA 2009 Database

Figure H3: Mean score, standard deviation, ranking and statistically significant differences between countries on the science scale

Country	Mean score		Standard deviation		Ranking		Countries whose mean score is NOT statistically significantly different from that of the listed country	Comparison of country's score with OECD average
	Mean	S.E.	S.D.	S.E.	Upper rank	Lower rank		
Shanghai-China	575	(2.3)	82	(1.7)	1	1		Statistically significantly **above** the OECD average
Finland	554	(2.3)	89	(1.1)	2	3	Hong Kong-China	
Hong Kong-China	549	(2.8)	87	(2.0)	2	3	Finland	
Singapore	542	(1.4)	104	(1.1)	4	6	Japan, Korea	
Japan	539	(3.4)	100	(2.5)	4	6	Singapore, Korea, New Zealand	
Korea	538	(3.4)	82	(2.3)	4	7	Singapore, Japan, New Zealand	
New Zealand	532	(2.6)	107	(2.0)	6	9	Japan, Korea, Canada, Estonia, Australia, Netherlands	
Canada	529	(1.6)	90	(0.9)	7	10	New Zealand, Estonia, Australia, Netherlands	
Estonia	528	(2.7)	84	(1.6)	7	11	New Zealand, Canada, Australia, Netherlands, Germany, Liechtenstein	
Australia	527	(2.5)	101	(1.6)	7	11	New Zealand, Canada, Estonia, Netherlands, Chinese Taipei, Germany, Liechtenstein	
Netherlands	522	(5.4)	96	(2.1)	7	16	New Zealand, Canada, Estonia, Australia, Chinese Taipei, Germany, Liechtenstein, Switzerland, United Kingdom, Slovenia	
Chinese Taipei	520	(2.6)	87	(1.6)	11	15	Australia, Netherlands, Germany, Liechtenstein, Switzerland, United Kingdom	
Germany	520	(2.8)	101	(1.9)	10	15	Estonia, Australia, Netherlands, Chinese Taipei, Liechtenstein, Switzerland, United Kingdom	
Liechtenstein	520	(3.4)	87	(3.4)	10	16	Estonia, Australia, Netherlands, Chinese Taipei, Germany, Switzerland, United Kingdom	
Switzerland	517	(2.8)	96	(1.4)	12	17	Netherlands, Chinese Taipei, Germany, Liechtenstein, United Kingdom, Slovenia, Macao-China	
England	515	(3.0)	99	(1.6)	14	19	Netherlands, Chinese Taipei, Germany, Liechtenstein, Switzerland, Slovenia, Macao-China, Poland, Ireland	
Slovenia	512	(1.1)	94	(1.0)	16	19	Netherlands, Switzerland, United Kingdom, Macao-China, Poland, Ireland, Belgium	
Macao-China	511	(1.0)	76	(0.8)	16	19	Switzerland, United Kingdom, Slovenia, Poland, Ireland, Belgium	
Poland	508	(2.4)	87	(1.2)	17	22	United Kingdom, Slovenia, Macao-China, Ireland, Belgium, Hungary, United States	
Ireland	508	(3.3)	97	(2.1)	16	23	United Kingdom, Slovenia, Macao-China, Poland, Belgium, Hungary, United States, Czech Republic, Norway	
Belgium	507	(2.5)	105	(2.3)	18	24	Slovenia, Macao-China, Poland, Ireland, Hungary, United States, Czech Republic, Norway, France	
Hungary	503	(3.1)	86	(2.9)	19	27	Poland, Ireland, Belgium, United States, Czech Republic, Norway, Denmark, France, Sweden, Austria	
United States	502	(3.6)	98	(1.7)	19	29	Poland, Ireland, Belgium, Hungary, Czech Republic, Norway, Denmark, France, Iceland, Sweden, Austria, Latvia, Portugal	
Czech Republic	500	(3.0)	97	(1.9)	21	29	Ireland, Belgium, Hungary, United States, Norway, Denmark, France, Iceland, Sweden, Austria, Latvia, Portugal	Not statistically significantly different from the OECD average
Norway	500	(2.6)	90	(1.0)	21	29	Ireland, Belgium, Hungary, United States, Czech Republic, Denmark, France, Iceland, Sweden, Austria, Latvia, Portugal	
Denmark	499	(2.5)	92	(1.3)	22	30	Hungary, United States, Czech Republic, Norway, France, Iceland, Sweden, Austria, Latvia, Portugal	
France	498	(3.6)	103	(2.8)	22	33	Belgium, Hungary, United States, Czech Republic, Norway, Denmark, Iceland, Sweden, Austria, Latvia, Portugal, Lithuania, Slovak Republic	
Iceland	496	(1.4)	95	(1.2)	26	32	United States, Czech Republic, Norway, Denmark, France, Sweden, Austria, Latvia, Portugal, Lithuania, Slovak Republic	
Sweden	495	(2.7)	100	(1.5)	25	34	Hungary, United States, Czech Republic, Norway, Denmark, France, Iceland, Austria, Latvia, Portugal, Lithuania, Slovak Republic, Italy	Statistically significantly **below** the OECD average
Austria	494	(3.2)	102	(2.2)	25	36	Hungary, United States, Czech Republic, Norway, Denmark, France, Iceland, Sweden, Latvia, Portugal, Lithuania, Slovak Republic, Italy, Spain, Croatia	
Latvia	494	(3.1)	78	(1.7)	25	35	United States, Czech Republic, Norway, Denmark, France, Iceland, Sweden, Austria, Portugal, Lithuania, Slovak Republic, Italy, Spain, Croatia	
Portugal	493	(2.9)	83	(1.4)	27	36	United States, Czech Republic, Norway, Denmark, France, Iceland, Sweden, Austria, Latvia, Lithuania, Slovak Republic, Italy, Spain, Croatia	
Lithuania	491	(2.9)	85	(2.1)	28	37	France, Iceland, Sweden, Austria, Latvia, Portugal, Slovak Republic, Italy, Spain, Croatia	
Slovak Republic	490	(3.0)	95	(2.6)	29	37	France, Iceland, Sweden, Austria, Latvia, Portugal, Lithuania, Italy, Spain, Croatia	
Italy	489	(1.8)	97	(1.5)	32	37	Sweden, Austria, Latvia, Portugal, Lithuania, Slovak Republic, Spain, Croatia	
Spain	488	(2.1)	87	(1.1)	32	37	Austria, Latvia, Portugal, Lithuania, Slovak Republic, Italy, Croatia, Luxembourg	
Croatia	486	(2.8)	85	(1.8)	33	39	Austria, Latvia, Portugal, Lithuania, Slovak Republic, Italy, Spain, Luxembourg,	
Luxembourg	484	(1.2)	104	(1.1)	37	39	Spain, Croatia, Russian Federation	
Russian Federation	478	(3.3)	90	(2.0)	38	40	Croatia, Luxembourg, Greece	
Greece	470	(4.0)	92	(2.1)	39	41	Russian Federation, Dubai (UAE)	
Dubai (UAE)	466	(1.2)	106	(1.1)	40	41	Greece	
Israel	455	(3.1)	107	(2.4)	42	43	Turkey, Chile	
Turkey	454	(3.6)	81	(2.0)	42	44	Israel, Chile	
Chile	447	(2.9)	81	(1.5)	43	45	Israel, Turkey, Serbia, Bulgaria	
Serbia	443	(2.4)	84	(1.6)	44	46	Chile, Bulgaria	
Bulgaria	439	(5.9)	106	(2.5)	44	47	Chile, Serbia, Romania, Uruguay	
Romania	428	(3.4)	79	(1.9)	47	49	Bulgaria, Uruguay, Thailand	
Uruguay	427	(2.6)	97	(1.7)	47	49	Bulgaria, Romania, Thailand	
Thailand	425	(3.0)	80	(2.0)	47	49	Romania, Uruguay	
Mexico	416	(1.8)	77	(0.9)	50	51	Jordan	
Jordan	415	(3.5)	89	(2.1)	50	52	Mexico, Trinidad and Tobago	
Trinidad and Tobago	410	(1.2)	108	(1.0)	51	53	Jordan, Brazil	
Brazil	405	(2.4)	84	(1.3)	52	56	Trinidad and Tobago, Colombia, Montenegro, Argentina, Tunisia, Kazakhstan	
Colombia	402	(3.6)	81	(1.8)	53	58	Brazil, Montenegro, Argentina, Tunisia, Kazakhstan	
Montenegro	401	(2.0)	87	(1.4)	54	58	Brazil, Colombia, Argentina, Tunisia, Kazakhstan	
Argentina	401	(4.6)	102	(3.7)	53	59	Brazil, Colombia, Montenegro, Tunisia, Kazakhstan, Albania	
Tunisia	401	(2.7)	81	(1.9)	53	58	Brazil, Colombia, Montenegro, Argentina, Kazakhstan	
Kazakhstan	400	(3.1)	87	(1.7)	53	58	Brazil, Colombia, Montenegro, Argentina, Tunisia, Albania	
Albania	391	(3.9)	89	(1.7)	58	60	Argentina, Kazakhstan, Indonesia	
Indonesia	383	(3.8)	69	(2.1)	59	62	Albania, Qatar, Panama, Azerbaijan	
Qatar	379	(0.9)	104	(0.8)	60	62	Indonesia, Panama	
Panama	376	(5.7)	90	(2.9)	60	64	Indonesia, Qatar, Azerbaijan, Peru	
Azerbaijan	373	(3.1)	74	(1.6)	62	64	Indonesia, Panama, Peru	
Peru	369	(3.5)	89	(2.1)	62	64	Panama, Azerbaijan	
Kyrgyzstan	330	(2.9)	91	(2.0)	65	65		

1. Countries listed in **bold** are OECD member states

Source: OECD, PISA 2009 Database

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