Results from the 2012 Programme for International Student Assessment (PISA):

How does the United States compare to other nations?
How has U.S. performance on PISA changed over time?
## Performance Among the 26 OECD Countries Continuously Participating in PISA Since 2000

### U.S. Stagnant or Falling Relative to Other Countries

<table>
<thead>
<tr>
<th>Subject</th>
<th>2000 Rank (out of 26)</th>
<th>2003 Rank (out of 26)</th>
<th>2006 Rank (out of 26)</th>
<th>2009 Rank (out of 26)</th>
<th>2012 Rank (out of 26)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>13&lt;sup&gt;th&lt;/sup&gt;</td>
<td>14&lt;sup&gt;th&lt;/sup&gt;</td>
<td>n/a</td>
<td>Tied 10&lt;sup&gt;th&lt;/sup&gt;</td>
<td>14&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Mathematics</td>
<td>17&lt;sup&gt;th&lt;/sup&gt;</td>
<td>22&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>22&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>Tied 20&lt;sup&gt;th&lt;/sup&gt;</td>
<td>22&lt;sup&gt;nd&lt;/sup&gt;</td>
</tr>
<tr>
<td>Science</td>
<td>13&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Tied 17&lt;sup&gt;th&lt;/sup&gt;</td>
<td>19&lt;sup&gt;th&lt;/sup&gt;</td>
<td>13&lt;sup&gt;th&lt;/sup&gt;</td>
<td>16&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

**Note:** Rankings are for the 26 countries that were members of the OECD and participated in PISA in 2000, 2003, 2006, 2009, and 2012 and include Luxembourg despite changes to assessment conditions beginning in 2003. 2006 results for U.S. reading performance are not available. Rankings for this chart only are based on rounded scale scores.

**Source:** PISA 2012 Results, OECD, Annex B1, Table I.5.3b, Table I.4.3b, Table I.2.3b
U.S. Performance Over Time

PISA – All Subjects

Note: Possible scores range from 0 to 1,000. Trends are not available from 2000 for all subjects due to revised assessment frameworks; 2006 results for U.S. reading performance are not available. * indicates score is significantly different from 2009 score at the p<.05 level.

Math Performance on PISA

Note: Possible scores range from 0 to 1,000. * indicates score is significantly different from the 2012 score at the p<.05 level
Reading Performance on PISA

Note: Possible scores range from 0 to 1,000. * indicates score is significantly different from the 2012 score at the p<.05 level. 2006 results for U.S. reading performance are not available.
Science Performance on PISA

Note: Possible scores range from 0 to 1,000. * indicates score is significantly different from the 2012 score at the p<.05 level
How do changes in U.S. performance compare to changes in other OECD countries?
U.S. Math Scores Have Remained Nearly Flat, In Contrast to Large Changes in Other OECD Countries

Source: PISA 2012 Results, OECD, Annex B1, Table I.2.3b
Reading Scores in Many Countries – Including the U.S. – Have Stayed Flat or Fallen

Source: PISA 2012 Results, OECD, Annex B1, Table I.4.3b
U.S. Students’ Science Scores Have Risen Faster than in Many Other OECD Countries

Source: PISA 2012 Results, OECD, Annex B1, Table I.5.3b
Improvements since the early 2000s have been concentrated among low-performing and average students.
Improvement Among Lowest-Performing Students, But Flat or Falling Scores for Others

PISA – Math

Improvement Only Among the Lowest Performing Students

PISA – Reading

Since 2006, Improvement Among Average and Lower Performing Students

PISA – Science

A closer look at math
Of 34 OECD Countries, U.S.A. Ranks 27th in Math Literacy

2012 PISA - Math

U.S.A. Ranks 28\textsuperscript{th} out of 34 OECD Countries on Students Scoring at the Highest Achievement Levels

PISA 2012 – Math

Note: Highest achievement levels are Levels 5 and above.
Source: PISA 2012 Results, OECD, Annex B1, Table I.2.1b
U.S.A. Ranks 28th out of 34 OECD Countries in the Math Achievement of the Highest-Performing Students

2012 PISA – Math

Note: Highest-performing students are those at the 90th Percentile.
Source: PISA 2012 results, OECD, Annex B1, Table I.2.3d.
U.S.A. Ranks 22nd out of 34 OECD Countries in the Math Achievement of the Lowest-Performing Students

Note: Lowest-performing students are those at the 10th Percentile.
Source: PISA 2012 results, OECD, Annex B1, Table I.2.3d.
U.S. students perform relatively low on all math topics
U.S.A. Ranks 27\textsuperscript{th} Out of 34 OECD Countries on the “Formulating” Subscale

2012 PISA – Math

Source: PISA 2012 Results, OECD, Annex B1, Table I.2.7
U.S.A. Ranks 28th Out of 34 OECD Countries on the “Employing” Subscale

2012 PISA – Math

Source: PISA 2012 Results, OECD, Annex B1, Table I.2.10
U.S.A. Ranks 27th Out of 34 OECD Countries on the “Interpreting” Subscale

2012 PISA – Math

Source: PISA 2012 Results, OECD, Annex B1, Table I.2.13

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U.S.A. Ranks 20th Out of 34 OECD Countries on the “Change and Relationships” Subscale

2012 PISA – Math

Source: PISA 2012 Results, OECD, Annex B1, Table I.2.16
U.S.A. Ranks 29th Out of 34 OECD Countries on the “Space and Shape” Subscale

2012 PISA – Math

Source: PISA 2012 Results, OECD, Annex B1, Table I.2.19
U.S.A. Ranks 29th Out of 34 OECD Countries on the “Quantity” Subscale

2012 PISA – Math

Source: PISA 2012 Results, OECD, Annex B1, Table I.2.22
U.S.A. Ranks 22\textsuperscript{nd} Out of 34 OECD Countries on the “Uncertainty and Data” Subscale

Source: PISA 2012 Results, OECD, Annex B1, Table I.2.25
U.S. reading and science performance is about average . . .
Of 34 OECD Countries, U.S.A. Ranks 20th in Science

2012 PISA - Science

- Higher than U.S. average
- Not measurably different from U.S. average
- Lower than U.S. average

Of 34 OECD Countries, U.S.A. Ranks 17th in Reading
2012 PISA - Reading


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The U.S. fares well compared to most non-OECD partner economies, but is far behind the top performers.
Compared with the 31 Participating Non-OECD Economies, the U.S.A. Ranks 10th in Math

Compared with the 31 Participating Non-OECD Economies, the U.S.A. Ranks 8th in Reading Literacy

Compared with the 31 Participating Non-OECD Economies, the U.S.A. Ranks 9th in Science

Clearly, the U.S. has a long way to go.
The U.S. doesn’t do well for any of its students – but it does especially poorly for disadvantaged students and students of color.
Neither low-SES students nor high-SES students compare well to their international counterparts . . .
U.S.A. Ranks 25th out of 34 OECD Countries in the Math Achievement of High-SES Students

Note: High SES students are those in the top quartile on the ESCS. The ESCS (Index of Economic, Social, and Cultural Status) is comprised of information related to parents’ occupational status, parents’ educational attainment, family wealth, home educational resources, and possessions related to “classical” culture in the home.
Source: PISA 2012 Results, OECD, Annex B1, Chapter 2, Table II.2.4a
U.S.A. Ranks 25th out of 34 OECD Countries in the Math Achievement of Low-SES Students

Note: Low SES students are those in the bottom quartile on the ESCS. The ESCS (Index of Economic, Social, and Cultural Status) is comprised of information related to parents’ occupational status, parents’ educational attainment, family wealth, home educational resources, and possessions related to “classical” culture in the home.

Source: PISA 2012 Results, OECD, Annex B1, Chapter 2, Table II.2.4a
Gaps between low-SES and high-SES students are large . . .
The U.S. Gap Between High-SES and Low-SES Students is Equivalent to Over Two Years of Schooling

Source: PISA 2012 Results, OECD, Annex B1, Chapter 2, Table II.2.4a
Low-SES students in the U.S. are less likely to be high performing than low-SES students in most other OECD countries . . .
The U.S. ranks 26th among 34 OECD Countries on the Percentage of Low-SES Students who are High-Performing

PISA 2012 - Math

Note: High-performing, low-SES students are those who are in the bottom quarter of the ESCS in their country but perform in the top quarter across students from all countries after accounting for socioeconomic background.

Source: PISA 2012 Results, OECD, Annex B1, Chapter 2, Table II.2.7a
The U.S. ranks 11th among the 34 OECD Countries on the Percentage of Low-SES Students who are Low-Performing

PISA 2012 - Math

Note: Low-performing, low-SES students are those who are in the bottom quarter of the ESCS in their country and perform in the bottom quarter across students from all countries after accounting for socioeconomic background.

Source: PISA 2012 Results, OECD, Annex B1, Chapter 2, Table II.2.7a
Within the United States, performance varies widely across groups of students . . .
African American and Latino Students Score Far Below White and Asian Counterparts

PISA 2012 – Math

<table>
<thead>
<tr>
<th>Race</th>
<th>Average Scale Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>506</td>
</tr>
<tr>
<td>African American</td>
<td>421</td>
</tr>
<tr>
<td>Latino</td>
<td>455</td>
</tr>
<tr>
<td>Asian</td>
<td>549</td>
</tr>
<tr>
<td>OECD Average</td>
<td>494</td>
</tr>
</tbody>
</table>

Students in Low Income Schools Score Far Below Students in Higher Income Schools

PISA 2012 – Math

Average scale score

Low Income 432
High Income 540
OECD Average 494

Note: Low income schools are those in which 75% or more of students are eligible for free or reduced price lunch; high income schools are those in which less than 10% are eligible.
Source: International Data Explorer, NCES
PISA Math Literacy Levels: Higher-Level Skills

• Level 6: Conceptualize, generalize, and utilize information based on investigations and modeling of complex problem situations; apply insight and understanding to develop new approaches for attacking novel situations; reflect on actions and formulate and communicate actions and reflections.

• Level 5: Develop and work with models for complex situations; select, compare, and evaluate appropriate problem-solving strategies; work strategically using broad, well-developed thinking and reasoning skills.

• Level 4: Work with explicit models for complex concrete situations; select and integrate different representations; reason in straightforward contexts.

PISA Math Literacy Levels: Lower-Level Skills

• Level 3: Execute clearly described procedures; select and apply simple problem-solving strategies; interpret and use representations based on different information sources and reason directly from those sources.

• Level 2: Interpret and recognize situations in contexts that require no more than direct inference; extract relevant information from a single source; make use of a single representational mode; employ basic conventions to solve problems; make literal interpretations of results.

• Level 1: Answer questions involving familiar contexts where all relevant information is present and questions are clearly defined; identify information and carry out routine procedures according to direct instructions.

Students of Color Far Less Likely to Have Higher Order Math Skills

Students in Lower Income Schools Far Less Likely to Have Higher Order Math Skills

Lower income schools are those in which 75% or more of students are eligible for free or reduced-price lunch; high income schools are those in which less than 10% of students are eligible for free or reduced-price lunch.

African American and Latino Students Score Far Below White and Asian Counterparts

PISA 2012 – Reading

Average scale score

<table>
<thead>
<tr>
<th></th>
<th>White</th>
<th>African American</th>
<th>Latino</th>
<th>Asian</th>
<th>OECD Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>519</td>
<td>443</td>
<td>478</td>
<td>550</td>
<td>496</td>
</tr>
</tbody>
</table>

Students in Low Income Schools Score Far Below Students in Higher Income Schools

PISA 2012 – Reading

Note: Low income schools are those in which 75% or more of students are eligible for free or reduced price lunch; high income schools are those in which less than 10% are eligible.
African American and Latino Students Score Far Below White and Asian Counterparts

PISA 2012 – Science

<table>
<thead>
<tr>
<th></th>
<th>Average scale score</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>528</td>
</tr>
<tr>
<td>African American</td>
<td>439</td>
</tr>
<tr>
<td>Latino</td>
<td>462</td>
</tr>
<tr>
<td>Asian</td>
<td>546</td>
</tr>
<tr>
<td>OECD Average</td>
<td>501</td>
</tr>
</tbody>
</table>

Students in Low Income Schools Score Far Below Students in Higher Income Schools

PISA 2012 – Science

| Average scale score | Low Income 442 | High Income 556 | OECD Average 501 |

Note: Low income schools are those in which 75% or more of students are eligible for free or reduced price lunch; high income schools are those in which less than 10% are eligible.
And there are no “easy” explanations for these gaps or for our low overall performance.
SES alone does not explain performance . . .
Some students in countries with much lower SES perform at higher levels

Source: PISA 2012 Results, OECD, Annex B1, Table I.2.3a; Annex B1, Chapter 2, Table II.2.4a.
The U.S. rank on math performance would not change if all 34 OECD countries had the same average socioeconomic status.

<table>
<thead>
<tr>
<th>Country</th>
<th>Actual Rank</th>
<th>Rank if SES were equalized across countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>27\textsuperscript{th}</td>
<td>27\textsuperscript{th}</td>
</tr>
<tr>
<td>Hungary</td>
<td>29\textsuperscript{th}</td>
<td>22\textsuperscript{nd}</td>
</tr>
<tr>
<td>Poland</td>
<td>8\textsuperscript{th}</td>
<td>3\textsuperscript{rd}</td>
</tr>
<tr>
<td>Portugal</td>
<td>23\textsuperscript{rd}</td>
<td>11\textsuperscript{th}</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>26\textsuperscript{th}</td>
<td>20\textsuperscript{th}</td>
</tr>
</tbody>
</table>

Source: PISA 2012 Results, OECD, Annex B1, Chapter 2, Table II.2.1
U.S. performance doesn’t improve if we consider only native-born students...
The U.S. has a larger percentage of immigrants and children of immigrants than most OECD countries...

Source: PISA 2012 Results, OECD, Annex B1, Chapter 3, Table II.3.6a
...But the U.S. ranks 27th out of 34 OECD countries when only taking into account native student* scores

PISA 2012 – Math

*Students born in the country of assessment with at least one parent born in the same country

Source: PISA 2012 Results, OECD, Annex B1, Chapter 3, Table II.3.4a
The U.S. is wealthier than and spends more money per pupil than most other countries, but this doesn’t translate into higher performance . . .
The U.S. has the third highest per capita GDP among OECD countries

Note: GDP per capita was converted into US dollars using purchasing power parities.
Source: PISA 2012 Results, OECD, Annex B1, Chapter 3, Table IV.3.2.
The U.S. is wealthier than other countries, but students perform at a lower level

**PISA 2012 - Math**

Source: PISA 2012 Results, OECD, Annex B1, Table I.2.3a; Annex B1, Chapter 3, Table IV.3.2.
The U.S. spends more money per student than nearly all other OECD countries

Source: PISA 2012 Results, OECD, Annex B1, Chapter 3, Table Iv.3.1.
The U.S. spends more money per student than other countries, but students perform at a lower level.

**PISA 2012 - Math**

Source: PISA 2012 Results, OECD, Annex B1, Table I.2.3a; Annex B1, Chapter 3, Table IV.3.1.
The U.S. spends more time per week on math instruction, but this doesn’t translate into higher achievement. . .
The U.S. spends more time on math instruction than nearly all other OECD countries

Source: PISA 2012 Results, OECD, Annex B1, Chapter 3, Table IV3.21.
The U.S. spends more money per student than other countries, but students perform at a lower level.

**PISA 2012 - Math**

Source: PISA 2012 Results, OECD, Annex B1, Table I.2.3a; Annex B1, Chapter 3, Table IV.3.21.