

Acknowledgements

We are grateful for the Kern Family Foundation's support for this project.
We are indebted to Michael Petrilli for his helpful feedback on earlier drafts;
to Kathryn Cifolillo for her careful editorial work;
to Bruce Sanders and Robin Cheung for their excellent design work;
to Ron Berry for table and figure construction;
and to Ashley Inman and Antonio Wendland for administrative assistance and technical support.
The views expressed here are our own and should not be attributed to any other
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Websites:
hks.harvard.edu/pepg
educationnext.org

Globally Challenged: Are U. S. Students Ready to Compete?

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by

Figure A.3
 Percentage of students in the Class of 2011 with at least one college-educated parent in U.S. states at the proficient level in math and percentage of all students at that level in foreign jurisdictions participating in PISA 2009 26

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America faces many challenges...but the enemy I fear most is complacency. We are about to be hit by the full force of global competition. If we continue to ignore the obvious task at hand while others beat us at our own game, our children and grandchildren will pay the price. We must now establish a sense of urgency.”

— Charles Vest, Former President
Massachusetts Institute of Technology

Executive Summary

As the world's leading nations continue to invest in their education systems, the United States must ensure that its students are prepared to compete in a global economy. This report examines the performance of U.S. students in mathematics and science, comparing them to their peers in other high-performing countries. The findings indicate that while U.S. students have made significant gains in recent years, they still lag behind their international counterparts in several key areas, particularly in advanced and proficient levels of mathematics.

Proficiency in Mathematics

The data shows that U.S. students are less likely to reach the advanced and proficient levels of mathematics compared to students in countries like Singapore and South Korea. This gap is most pronounced in the advanced category, where U.S. students represent a significantly smaller percentage of the total student population. The report identifies several factors that may contribute to this performance gap, including differences in curriculum, teaching methods, and student motivation. Addressing these challenges will require targeted interventions and a renewed focus on high-quality mathematics education for all students.

Globally Challenged: Are U.S. Students Ready to Compete?

- Paul E. Peterhon
- Ludger Woess010n
- Eric A. Hanushek
- Carlos X. Lastra-Anadón

1. [http://www.pisa.org](#)

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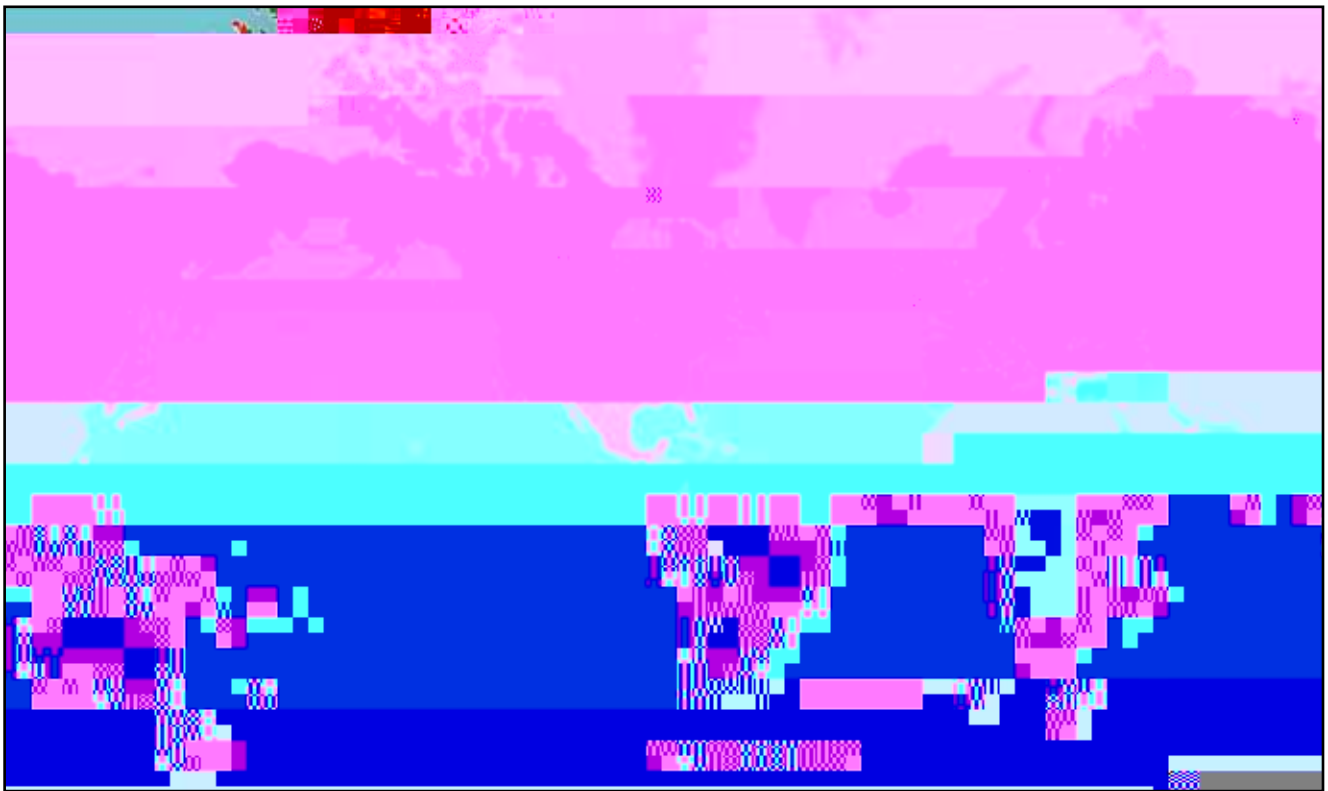
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What Do These Findings Mean?

2

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Sixty-five countries participated in the math and reading examinations administered by the Program for International Student Assessment (PISA).





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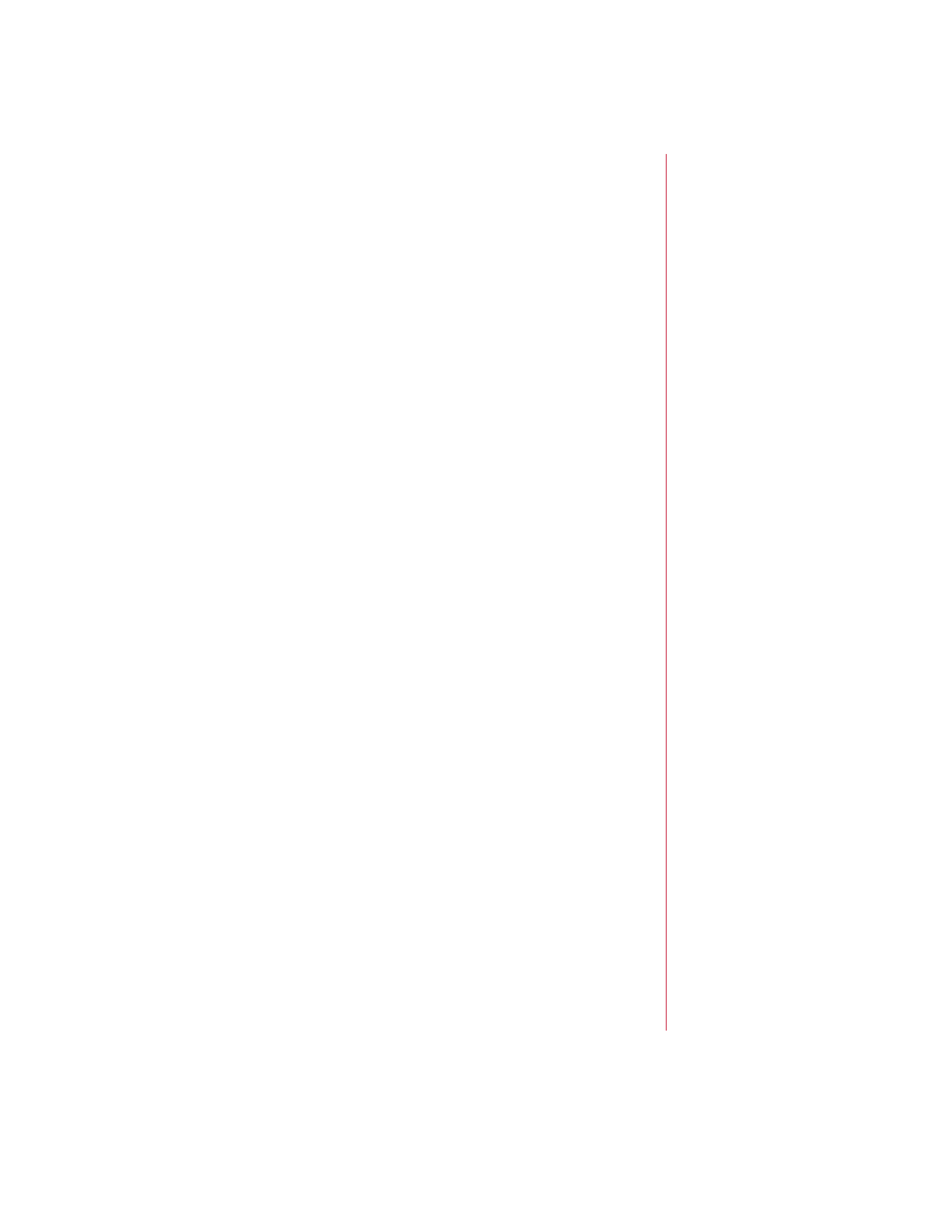
Comparing U.S. Students with Peers in Other Countries

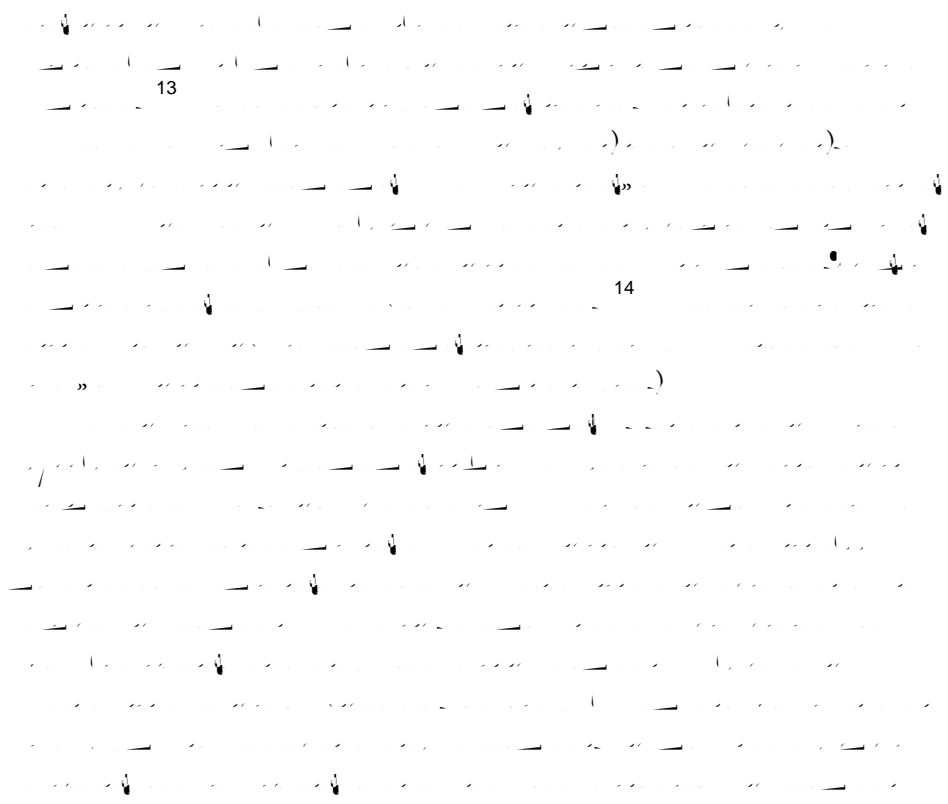
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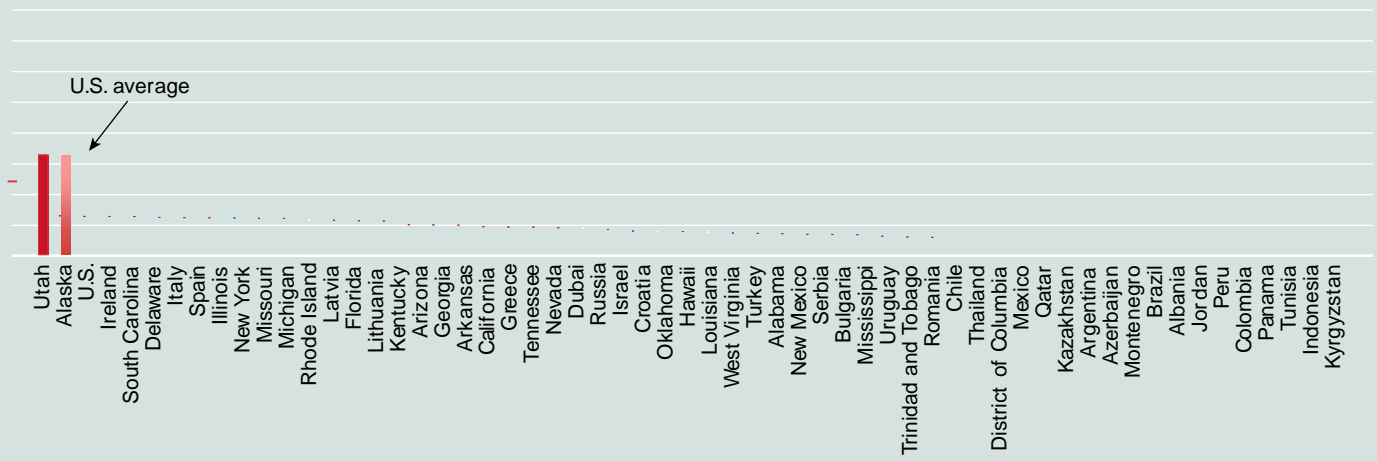
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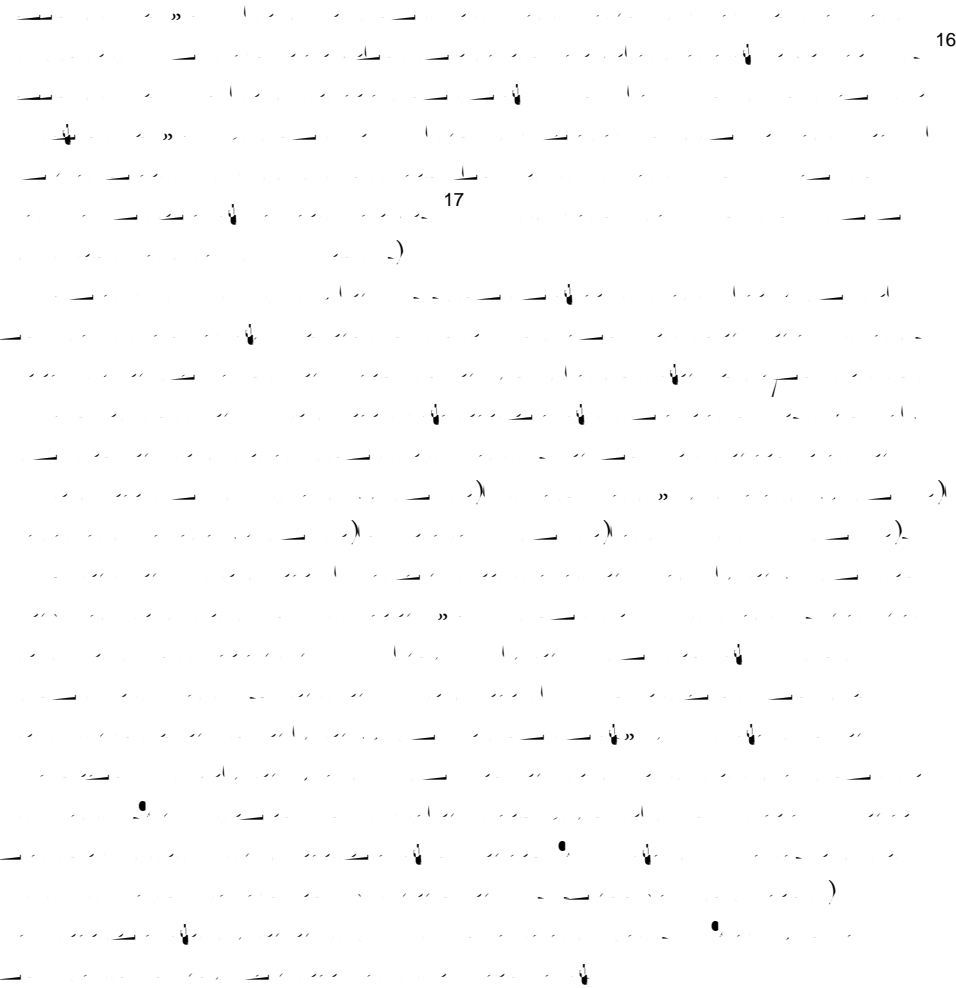


The chart displays a comparison of various countries and U.S. states against the U.S. average. Utah and Alaska are the only entities shown with bars extending to the right of the U.S. average line, indicating they are above the average. All other entities have bars extending to the left of the U.S. average line, indicating they are below the average. The entities listed include Utah, Alaska, U.S., Ireland, South Carolina, Delaware, Italy, Spain, Illinois, New York, Missouri, Michigan, Rhode Island, Latvia, Florida, Lithuania, Kentucky, Arizona, Georgia, Arkansas, California, Greece, Tennessee, Nevada, Dubai, Russia, Israel, Croatia, Oklahoma, Hawaii, Louisiana, West Virginia, Turkey, Alabama, New Mexico, Serbia, Bulgaria, Mississippi, Uruguay, Trinidad and Tobago, Romania, Chile, Thailand, District of Columbia, Mexico, Qatar, Kazakhstan, Argentina, Azerbaijan, Montenegro, Brazil, Albania, Jordan, Peru, Colombia, Panama, Tunisia, Indonesia, and Kyrgyzstan.

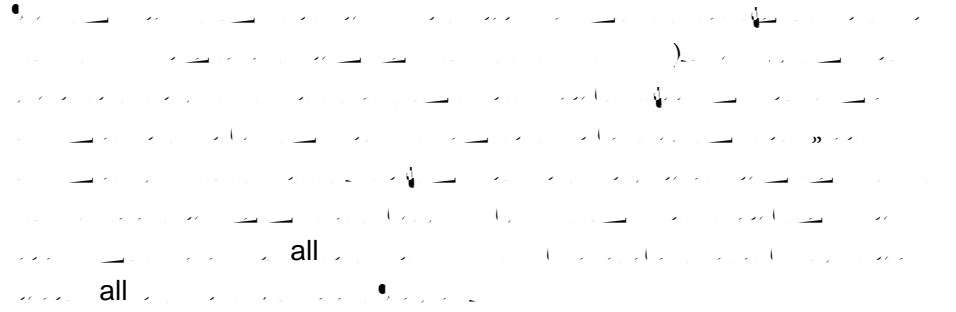
Table 1

This image shows a blank table template. The background is a light pink color. The table structure is defined by horizontal red lines. A single white row is present, positioned approximately halfway down the page. The rest of the table area is empty, with no text or data entries.

Proficiency in Reading



Performance of U.S. Ethnic and Racial Groups



Percentage Proficient

60
50
40
30
20
10
0

Shanghai
Korea
Finland
Hong Kong
Massachusetts
Singapore
Vermont
New Zealand
Japan
Canada
New Jersey
Montana
Australia
New Hampshire
Connecticut
Belgium
Maine
South Dakota
Minnesota
Pennsylvania
Ohio
Iowa
Kansas
Nebraska
Colorado
Netherlands

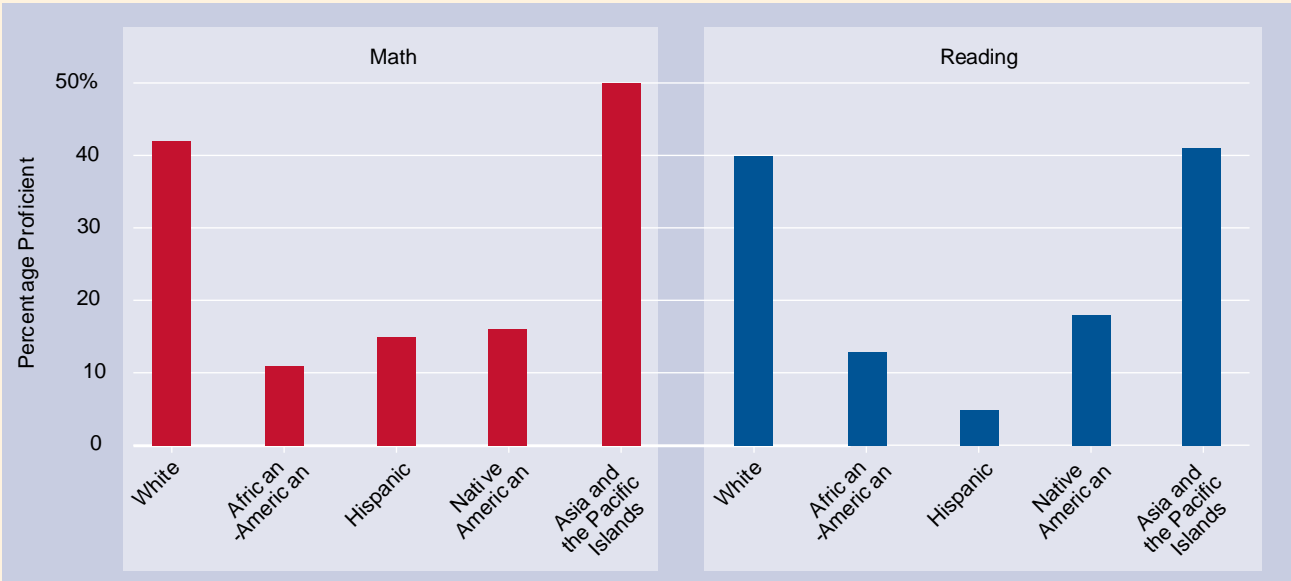
Kentucky
Texas
Taiwan
Rhode Island
Alaska
Italy
Denmark
Israel
Oklahoma
Georgia
Tennessee
Arkansas
Portugal
Slovenia
Greece
South Carolina
Arizona
Luxembourg
Austria
Czech Rep
West Virginia
Slovakia
Spain
Nevada
California
Alabama
Latvia
Dubai
Macao
Croatia
Hawaii
Louisiana
Lithuania
Mississippi
New Mexico
Turkey
Russia
Bulgaria
District of Columbia
T

all

Comparable PISA Question

Question: Underline
the sentence that
explains what the

Percentage of students in the class of 2011 in the U.S. at the proficient level in math and reading, by race and ethnicity. (Figure 3)



Students from College-educated Families

Students from college-educated families are more likely to be proficient in math and reading than students from high school-educated families. In 2011, 42% of students from college-educated families were proficient in math, compared to 31% of students from high school-educated families. In reading, 40% of students from college-educated families were proficient, compared to 31% of students from high school-educated families. The gap in proficiency between these two groups is larger in reading than in math.

Table 2

1	Massachusetts	43.0	1	Canada • Finland • Japan • Korea • Singapore
2	Vermont	42.1	3	Canada • Japan • Korea • New Zealand • Singapore
3	New Jersey	39.0	5	Australia • Belgium • Canada • Japan • Netherlands
4	Montana	38.9	5	Australia • Belgium • Canada • Japan • Netherlands
5	New Hampshire	37.2	8	Australia • Belgium • Liechtenstein • Netherlands
6	Connecticut	37.1	7	Australia • Belgium • France • Japan • Netherlands
7	Maine	36.9	8	Australia • Belgium • Liechtenstein • Netherlands
8	South Dakota	36.8	5	Australia • Canada • France • Japan • Netherlands
9	Minnesota	36.6	8	Australia • Belgium • Liechtenstein • Netherlands
10	Pennsylvania	36.4	8	Australia • Belgium • France • Liechtenstein • Netherlands
11	Ohio	35.9	8	Australia • Belgium • France • Liechtenstein • Netherlands
12	Iowa	35.7	8	Australia • Belgium • France • Liechtenstein • Netherlands
13	Kansas	35.2	9	Belgium • France • Liechtenstein • Netherlands
14	Nebraska	35.0	9	Belgium • France • Liechtenstein • Netherlands
15	Colorado	34.6	8	Australia • Belgium • France • Germany • Netherlands
16	Washington	34.1	10	France • Germany • Netherlands • Norway • Switzerland
17	Oregon	34.0	8	Australia • France • Germany • Poland • Switzerland
18	Virginia	33.7	9	Belgium • France • Germany • Netherlands • Poland
19	Wisconsin	33.2	10	France • Germany • Hungary • Netherlands • Poland
20	Wyoming	33.2	10	France • Germany • Netherlands • Norway • Switzerland
21	Maryland	33.2	10	France • Germany • Netherlands • Poland • Sweden
22	New York	32.2	10	France • Germany • Hungary • Netherlands • Poland
23	North Dakota	32.2	10	France • Germany • Hungary • Netherlands • Poland
24	Idaho	31.6	10	France • Germany • Netherlands • Norway • Poland
	United States	France		France • Germany • Netherlands • Norway • Poland

Are the Proficiency Standards the Same for Math as for Reading?

The proficiency standards for math and reading are not the same. While both subjects have standards that define what students should know and be able to do, the specific skills and knowledge required are different. Math standards focus on mathematical concepts, problem-solving, and reasoning, while reading standards focus on comprehension, analysis, and communication. The standards are designed to be aligned with the content and skills taught in each subject, ensuring that students are prepared for the challenges of each discipline.

Math proficiency standards typically include areas such as number and operations, algebra, geometry, and data analysis. These standards emphasize the application of mathematical concepts to solve real-world problems and the use of logical reasoning to justify solutions. Reading proficiency standards, on the other hand, focus on the ability to read and understand various types of texts, including fiction, non-fiction, and informational texts. These standards emphasize the use of reading strategies to analyze and evaluate the content and structure of texts.

The differences between math and reading proficiency standards reflect the unique demands of each subject. Math requires a strong foundation in mathematical concepts and the ability to apply these concepts to solve complex problems. Reading requires a strong foundation in reading skills and the ability to analyze and evaluate the content and structure of texts. Both subjects are essential for a well-rounded education, and the proficiency standards ensure that students are prepared to meet the challenges of each discipline.

20. The figure shows a rectangular prism with a length of 10 units, a width of 6 units, and a height of 4 units. The prism is divided into two parts by a diagonal plane that passes through the top-left corner of the front face, the top-right corner of the back face, and the bottom-right corner of the front face. What is the volume of the smaller part of the prism?

- 20. The figure shows a rectangular prism with a length of 10 units, a width of 6 units, and a height of 4 units. The prism is divided into two parts by a diagonal plane that passes through the top-left corner of the front face, the top-right corner of the back face, and the bottom-right corner of the front face. What is the volume of the smaller part of the prism?
- 21. The figure shows a rectangular prism with a length of 10 units, a width of 6 units, and a height of 4 units. The prism is divided into two parts by a diagonal plane that passes through the top-left corner of the front face, the top-right corner of the back face, and the bottom-right corner of the front face. What is the volume of the larger part of the prism?

Appendix

Differences in the Math Performance of the High School Classes of 2009 and 2011

The following table shows the differences in the math performance of the high school classes of 2009 and 2011. The table is organized by subject area and then by grade level. The columns represent the number of students who performed at each level in each year. The rows represent the number of students who performed at each level in each year. The table shows that there were significant differences in the math performance of the high school classes of 2009 and 2011.

Subject Area	Grade Level	2009	2011
Mathematics	Grade 9	Advanced	10
		Accelerated	15
		Standard	20
		Basic	25
Mathematics	Grade 10	Advanced	12
		Accelerated	18
		Standard	22
		Basic	28
Mathematics	Grade 11	Advanced	14
		Accelerated	20
		Standard	24
		Basic	30
Mathematics	Grade 12	Advanced	16
		Accelerated	22
		Standard	26
		Basic	32
Science	Grade 9	Advanced	8
		Accelerated	12
		Standard	16
		Basic	20
Science	Grade 10	Advanced	10
		Accelerated	14
		Standard	18
		Basic	22
Science	Grade 11	Advanced	12
		Accelerated	16
		Standard	20
		Basic	24
Science	Grade 12	Advanced	14
		Accelerated	18
		Standard	22
		Basic	26

The table shows that there were significant differences in the math performance of the high school classes of 2009 and 2011. The number of students who performed at the advanced level increased from 10 in 2009 to 16 in 2011. The number of students who performed at the accelerated level increased from 15 in 2009 to 22 in 2011. The number of students who performed at the standard level increased from 20 in 2009 to 26 in 2011. The number of students who performed at the basic level increased from 25 in 2009 to 32 in 2011.

Performing the Crosswalk

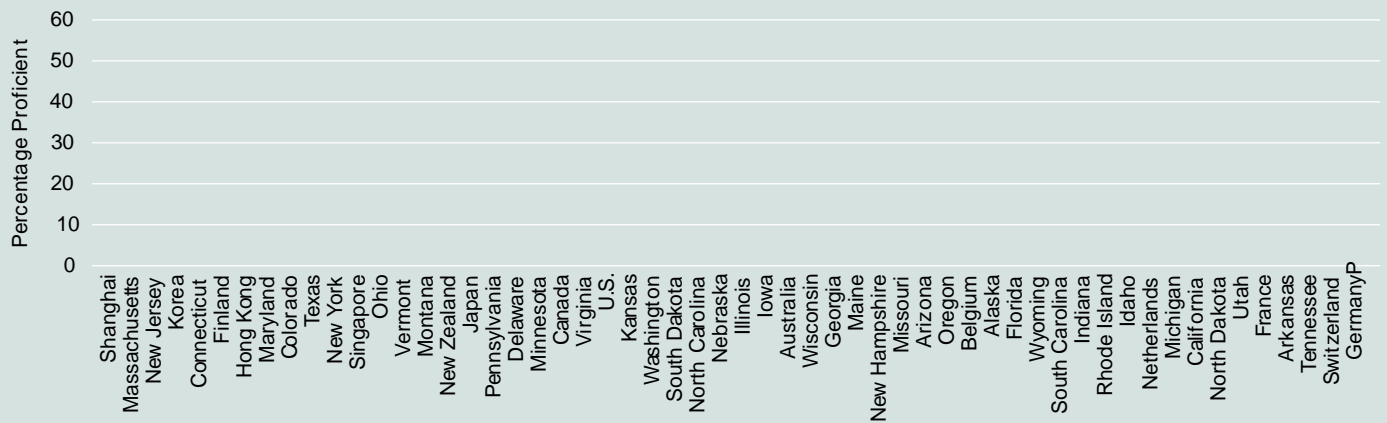
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Handwritten text in the second column, starting with a large number '2' and containing several lines of notes.

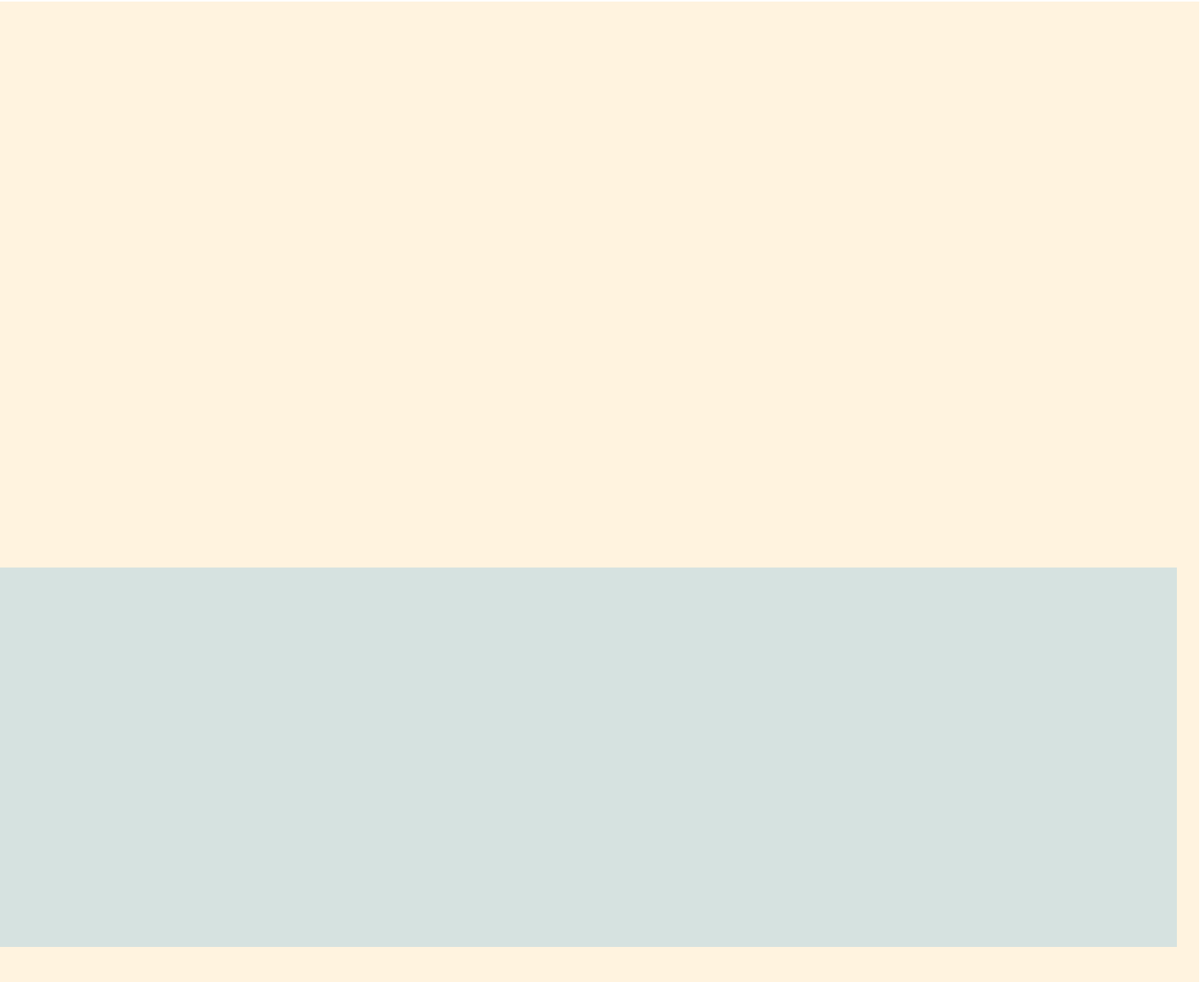
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Handwritten text in the fourth column, starting with a large number '2' and containing several lines of notes.

1. Handwritten list item 1, starting with a large number '1' and containing several lines of notes.
2. Handwritten list item 2, starting with a large number '2' and containing several lines of notes.



10



Germany
Norway
Iceland
West Virginia
Poland
Sweden
Liechtenstein
Ireland
U.K.
Alabama
Hungary
Estonia
Nevada
Hawaii
Taiwan
Italy
Denmark
Israel
New Mexico
Portugal
Slovenia
Greece
Louisiana
Luxembourg
Austria
Czech Rep.
Mississippi
Slovakia
Spain
Latvia
Dubai
Macao
Croatia

the proficient level in reading and percentage of students at that level in foreign jurisdictions

Table A.1

white

.856 664.714 re f 0.98 0.94 0.884 scn 56.646 446.615

Table A.2

white

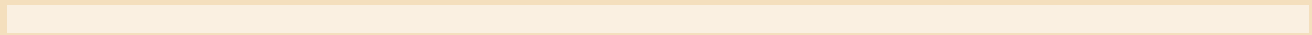


Table A.4

with at least one college-educated parent.

1	Massachusetts	57.4	0	Shanghai
2	Vermont	52.7	0	Korea
3	New Jersey	49.8	0	Finland • Korea
4	Connecticut	48.6	1	Finland • Korea
5	Pennsylvania	47.7	1	Finland • Korea
6	Oregon	47.1	1	Finland • Japan • Korea • New Zealand • Singapore
7	Ohio	47.1	1	Finland • Japan • Korea • New Zealand • Singapore
8	Montana	46.9	1	Finland • Korea
9	New Hampshire	46.8	1	Finland • Korea
10	Maine	45.8	1	Finland • Japan • Korea • New Zealand • Singapore
11	Kansas	45.8	1	Finland • Japan • Korea
12	Virginia	44.3	1	Australia • Canada • Japan • Korea • Netherlands
13	Minnesota	44.2	1	Finland • Japan • Korea • New Zealand • Singapore
14	Maryland	44.1	1	Canada • Finland • Japan • Korea • Netherlands
15	Colorado	44.0	1	Australia • Canada • Japan • Korea • Netherlands
16	Iowa	43.9	1	Canada • Finland • Japan • Korea • Singapore
17	South Dakota	43.9	1	Australia • Canada • Japan • Korea • Netherlands
18	Washington	42.9	1	Canada • Finland • Japan • Korea • Netherlands
19	Nebraska	42.5	1	Canada • Finland

11 CanadaZ

Table A.5

Table A.5 is a large table that has been redacted with a solid tan background. Only the top header row is visible, showing several columns of text that are mostly illegible due to the redaction. A horizontal white line is visible near the bottom of the table area.

Biographical Sketches

Paul E. Peterson



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