



# Minnesota 12<sup>th</sup> Grade Results

Third International Mathematics and Science Study (TIMSS)

April 1999

## Overview of TIMSS

TIMSS (Third International Mathematics and Science Study) is the largest and most thorough international study of mathematics and science education ever conducted. During the spring of 1995, a number of countries participated in surveys of school practices and conducted student testing at grades 4, 8, and 12 (final year of secondary school).

With sponsorship by SciMath<sup>MN</sup>, the State of Minnesota participated in TIMSS as a 'mini-nation' at all three grade levels, making it possible to compare Minnesota's results with the U.S. as a whole as well as other participating countries.

This report summarizes Minnesota's results in the TIMSS assessments at grade 12. Earlier reports

produced by SciMath<sup>MN</sup> summarized Minnesota's performance on TIMSS at fourth grade (June 1998) and at eighth grade (March 1997).

At the 12<sup>th</sup>-grade level, Minnesota participated in the general mathematics and science literacy testing to ascertain the general level of math and science learning achieved by a representative sampling of all students statewide. Minnesota did not participate in the assessments for advanced students (calculus and physics).

The results for the U.S. as a whole, released in February 1998, were disappointing. U.S. 12<sup>th</sup> graders scored below the international average and among the lowest of the 21 TIMSS nations in both mathematics and science general knowledge.

## Minnesota 12<sup>th</sup>-grade results at a glance

On the **combined mathematics and science assessment**, Minnesota scored just above the international average for the 21 countries participating. This is significantly better than the U.S. average, which was in the bottom quartile.



On the **mathematics assessment**, Minnesota scored just below the international average. The relative standing of Minnesota's 12<sup>th</sup> graders in mathematics was lower than the relative standing attained by the state's eighth graders.

On the **science assessment**, Minnesota scored above the international average. The relative standing of Minnesota's 12<sup>th</sup> graders in science was lower than the relative standing attained by the state's eighth graders.



**Participation.** Only half of Minnesota's high school seniors were taking mathematics in 1995, compared with

two-thirds in the U.S. sample. About 54 percent of Minnesota's seniors reported taking at least one science class in their final year, which was about equal to the U.S. rate.

**Gender gap.** Male students in the Minnesota 12<sup>th</sup>-grade sample significantly outperformed their female counterparts in both mathematics and science.

**Curriculum differences.** The mathematics topics on the TIMSS 12<sup>th</sup> grade tests were typically covered by about the seventh grade in most TIMSS countries, but typically later in the U.S. and Minnesota. The science topics were typically covered by ninth grade in most TIMSS countries, but typically later in the U.S. and Minnesota.

**Instruction.** Standards-based instruction appears to be associated with higher achievement in the Minnesota 12<sup>th</sup>-grade results. This was not true with the fourth and eighth grade Minnesota TIMSS data.

# Mathematics and science literacy achievement

## Students in their final year of secondary school

Nations whose composite mathematics and science literacy score is **significantly higher** than Minnesota:

(Netherlands)	559
Sweden	555
(Iceland)	541
(Norway)	536
Switzerland	531
(Denmark)	528
(Canada)	526
New Zealand	525

### Key to scores

- = scores significantly higher than MN
- = scores not significantly different from MN
- = scores significantly lower than MN

Nations whose composite literacy score **does not differ significantly** from Minnesota's:



(Australia)	525
(Austria)	519
(Slovenia)	514
(France)	505
<b>MINNESOTA</b>	<b>503</b>
(Germany)	496
Czech Republic	476

◀ = International Average

◀ 500

Nations whose composite literacy score is **significantly lower** than Minnesota's:

Hungary	477
Russian Federation	476
(Italy)	475
<b>(UNITED STATES)</b>	<b>471</b>
Lithuania	465
Cyprus	447
(South Africa)	352

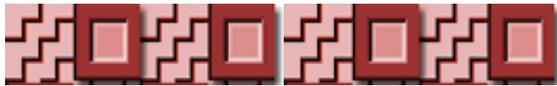
[Notes: (1) Nations not meeting international sampling guidelines are shown in parentheses. (2) Some scale scores are "out of order" in ranking due to differences in sampling variability.]

Source: Lutkus, A.D. et al., *Mathematics and Science Achievement in the Final Year of Secondary School in Minnesota: Results from IEA's Third International Mathematics and Science Study (TIMSS)*. Prepared by Educational Testing Service under contract with Westat, Inc. December 1998.



## Summary of state results in international context

The sampling of students for the 12<sup>th</sup> grade TIMSS assessments was comprised of students in their final year of secondary school, regardless of their age or curriculum track. Minnesota's 12<sup>th</sup> grade sample included 53 high schools from around the state, including private as well as public schools. The state sample was balanced with regard to school type, geography, and minority status.



### What is math and science "literacy"?

The mathematics and science literacy tests given to TIMSS participants in all the countries were designed to measure the knowledge and skills necessary for citizens (of any country) in their daily lives. A major goal of TIMSS at this grade level was to assess how well individuals entering adulthood understand the mathematics and science needed to function effectively in society.

For the 21 countries participating in the TIMSS general literacy assessments, the mathematics topics in the test were generally covered by about seventh grade (though typically not until the ninth grade in the U.S.). The science topics in the TIMSS test were generally covered by ninth grade (though typically not until the 11<sup>th</sup> grade in the U.S.).



### Comparing top students

TIMSS data provide an average score for the top 25 percent of students in each country. Minnesota's top quartile was in the middle, with the top quartile of 11 countries significantly better than Minnesota and three countries about the same. In seven countries, including the U.S., the top quartile of students performed significantly below Minnesota's top group.

In a more general sense, the TIMSS data show that the U.S. brings a considerably smaller percentage of its students to meet high performance standards than do other countries.

### Gender differences

Minnesota's 12<sup>th</sup> grade TIMSS results showed a gender gap favoring male students in both mathematics and science. This contrasts with Minnesota's results on TIMSS at grades four and eight, where there were not significant differences by gender in performance on either the math or science assessments.



### Participation

Mathematics and science course-taking rates for Minnesota seniors were significantly lower than rates for the U.S. and the other TIMSS countries. On average, the countries had 79 percent of their seniors enrolled in at least one math course. By contrast, in the U.S. sample only two-thirds of seniors reported taking math and in Minnesota, only one-half of the seniors were enrolled in a math course. In science, Minnesota's participation rate (54 percent) was also significantly below the international average (67 percent) but about the same as the U.S. science course-taking average.

As might be predicted, there is a significant difference in performance favoring students currently taking math or science courses as compared to those not currently enrolled. The difference was +59 scale points in math and +63 in science. In Minnesota, the two genders were about equally likely to stop taking math or science by their senior year.

# Mathematics literacy achievement

## Students in their final year of secondary school

(Netherlands)	560
Sweden	552
(Denmark)	547
Switzerland	540
(Iceland)	534
(Norway)	528
(France)	523
New Zealand	522
(Canada)	519
(Austria)	518

(Australia)	522
(Slovenia)	512
<b>MINNESOTA</b>	<b>495</b> ◀ = 500
(Germany)	495
Hungary	483
Czech Republic	466

◀ = International Average

(Italy)	476
Russian Fed.	471
Lithuania	469
<b>(UNITED STATES)</b>	<b>461</b>
Cyprus	446
(South Africa)	356

### Key to scores

- = scores significantly higher than MN
- = scores not significantly different from MN
- = scores significantly lower than MN

[Notes: (1) Nations not meeting international sampling guidelines are shown in parentheses. (2) Some scale scores are "out of order" in ranking due to differences in sampling variability.]

Source: Lutkus, A.D. et al., *Mathematics and Science Achievement in the Final Year of Secondary School in Minnesota: Results from IEA's Third International Mathematics and Science Study (TIMSS)*. Prepared by Educational Testing Service under contract with Westat, Inc. December 1998.

### Sample mathematics questions

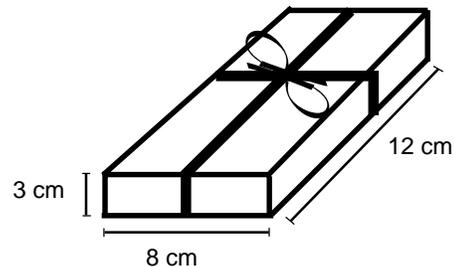
Experts say that 25% of all serious bicycle accidents involve head injuries and that, of all head injuries, 80% are fatal.

What percentage of all serious bicycle accidents involve fatal head injuries?

- A. 16%
- B. 20%
- C. 55%
- D. 105%

Answer: B U.S. Avg: 57% Int'l Avg: 64%

Sue wants to wrap some ribbon around a box as shown and have 25 cm left to tie a bow.



How long a piece of ribbon does she need?

- A. 46 cm
- B. 52 cm
- C. 65 cm
- D. 71 cm
- E. 77 cm

Answer: E U.S. Avg: 32% Int'l Avg: 45%



# Minnesota achievement in mathematics literacy

At the 12<sup>th</sup> grade (final year of secondary school) on TIMSS, Minnesota participated in the general mathematics literacy testing, but did not take part in the TIMSS assessment of advanced mathematics that was given to students who had taken or were taking calculus.

The mathematics literacy test questions covered number sense (including fractions, percentages, and proportionality), algebraic sense, measurement and estimation, and data representation and analysis. Items were chosen based on their likelihood of arising in real-life situations. Students were permitted to use a calculator.



## Minnesota's performance

Minnesota's scale score on the 12<sup>th</sup> grade TIMSS assessment was 495, where 500 represented the mean score for the 21 participating countries.

Among the group of eight countries that satisfied all of the TIMSS sampling requirements, Sweden, Switzerland, and New Zealand scored above Minnesota at the 12<sup>th</sup> grade level. Of the 21 participating countries, 12 countries exceeded Minnesota's mean score on the mathematics literacy exam.

Minnesota's 12<sup>th</sup> grade mathematics literacy mean score of 495 was significantly higher than that of the United States (461) and five other countries.

## Performance by gender

Minnesota's mathematics literacy scores on the 12<sup>th</sup> grade TIMSS assessment showed a significant gender gap favoring males. By contrast, the U.S. math scores did not show a gender gap.

Only three countries participating in the 12<sup>th</sup> grade TIMSS tests showed an absence of gender differences—

the U.S., Hungary, and South Africa. However, the gender difference of 21 points in Minnesota was among the smallest of the countries showing a difference. At fourth and eighth grades, the performance of Minnesota students on TIMSS showed no gender difference in math.

## Performance on mathematics v. science

Another way to understand the performance of countries (or states) on TIMSS is to compare the difference between the mean scores for math and science and how that difference compares with other participating countries.

On the TIMSS 12<sup>th</sup> grade math and science literacy assessments, Minnesota's difference in mean scores between math and science was 15 scale points (511 vs. 495), with science performance being higher than mathematics. The U.S. showed a similar difference favoring science.

Minnesota and seven other countries, including the U.S., showed significantly higher achievement in science literacy than in mathematics.



## Comparing mathematics performance on TIMSS at grades 8 and 12

The relative performance of Minnesota students on TIMSS at the two grade levels can be judged by comparing their respective mean scores to the international mean.

The U.S. dropped significantly in relative standing from grade eight to grade 12 in mathematics. Minnesota also dropped in relative standing, though less so than the U.S. drop, moving from 12 points above the mean for the eighth grade mathematics assessment to five points below the mean for the 12<sup>th</sup> grade assessment.

# Science literacy achievement

## Students in their final year of secondary school

Sweden	559
(Netherlands)	558
(Iceland)	549
(Norway)	544
(Canada)	532

New Zealand	529
(Australia)	527
Switzerland	523
(Austria)	520
(Slovenia)	517
<b>MINNESOTA</b>	<b>511</b>
(Denmark)	509
(Germany)	497
Czech Republic	487

◀ = International Average

(France)	487
Russian Federation	481
<b>(UNITED STATES)</b>	<b>480</b>
(Italy)	475
Hungary	471
Lithuania	461
Cyprus	448
(South Africa)	349

### Key to scores

- = scores significantly higher than MN
- = scores not significantly different from MN
- = scores significantly lower than MN

[Notes: (1) Nations not meeting international sampling guidelines are shown in parentheses. (2) Some scale scores are "out of order" in ranking due to differences in sampling variability.]

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### Sample science questions

It is often claimed that "cooked vegetables are not as nutritious as the same kinds of vegetables uncooked." What could be done to find out if this statement is true?

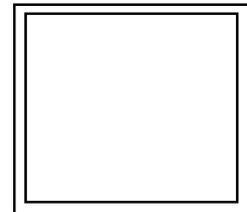
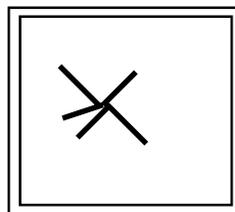
- A. Compare the weight of the vegetables before and after they are cooked.
- B. Compare the colour of the cooked and uncooked vegetables.
- C. Test the acidity of the water in which the vegetables are cooked.
- D. Compare the vitamin content of the cooked and uncooked vegetables.

Answer: D      U.S. Avg: 81%      Int'l Avg: 87%

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The sketch below shows two windows. The left window has been cracked by a flying stone. A tennis ball, with the same mass and speed as the stone, strikes the adjacent, similar window, but does not crack it.

What is one important reason why the impact of the stone cracks the window but the impact of the tennis ball does not?



U.S. Avg: 54%

Int'l Avg: 57%



# Minnesota achievement in science literacy

At the 12<sup>th</sup> grade (final year of secondary school) on TIMSS, Minnesota participated in the general science literacy testing, but did not take part in the TIMSS assessment of advanced science that was given to students who had taken or were taking physics.

The science literacy or general knowledge assessment test questions were organized into three areas of science—earth science, life science, and physical science. Items were chosen based on their likelihood of arising in real-life situations and not on their connection to any particular curriculum. Students were permitted to use a calculator.

## Minnesota's performance

Minnesota's scale score on the 12<sup>th</sup> grade TIMSS general science literacy assessment was 511, where 500 represented the mean scores for the 21 participating countries.

Among the group of eight countries that satisfied all of the TIMSS sampling requirements, Sweden, Switzerland, and New Zealand scored above Minnesota, just as they had in the mathematics assessment. Of the 21 countries participating in TIMSS at this grade level, five countries significantly outperformed Minnesota on the science literacy assessment.

Minnesota's 12<sup>th</sup> grade science literacy mean score of 511 was significantly higher than that of the U.S. (480) and seven other countries.



## Performance by gender

Minnesota's science literacy scores on the 12<sup>th</sup> grade TIMSS assessment showed a significant (28 points) gender gap favoring males, as did the mathematics scores. All participating countries except South Africa

showed a gender gap on the 12<sup>th</sup> grade science literacy assessment.

In science, the performance of Minnesota students on TIMSS showed a small gap favoring males at grade four and a 16-point gap at grade eight, but neither gap was statistically significant.

## Performance on science vs. mathematics

For Minnesota, the difference in mean scores between math and science on the TIMSS 12<sup>th</sup> grade general assessments was statistically significant at 15 scale points (511 for science v. 495 for math). The U.S. showed a similar difference.

Minnesota and seven of the TIMSS countries, including the U.S., showed significantly higher achievement in science literacy than in mathematics.



## Comparing TIMSS science performance at grades 8 and 12

The relative performance of Minnesota students on TIMSS at the two grade levels can be judged by comparing their respective mean scores to the international mean.

Minnesota's eighth-grade students ranked among the top nations in the TIMSS science assessment, outperforming 26 of 41 participating countries. By comparison, Minnesota's 12<sup>th</sup> graders dropped in relative standing, from 53 points above the mean for eighth grade to 11 points above the mean for the 12<sup>th</sup> grade science assessment. However, Minnesota's relative standing dropped far less than that of the U.S. for the eighth versus 12<sup>th</sup> grade comparison.



# Mean mathematics scores—Minnesota comparison

## 4<sup>th</sup> Grade Mathematics

Singapore	625
Korea	611
Japan	597
Hong Kong	587
Netherlands	577
Czech Republic	567

## 8<sup>th</sup> Grade Mathematics

Singapore	643
Korea	607
Japan	605
Hong Kong	588
Belgium-Flemish	565
Czech Republic	564

## 12<sup>th</sup> Grade Mathematics

(Netherlands)	560
Sweden	552
(Denmark)	547
Switzerland	540
(Iceland)	534
(Norway)	528
(France)	523
New Zealand	522
(Canada)	519
(Austria)	518

Austria	559
Slovenia	552
Ireland	550
Hungary	548
Australia	546
<b>UNITED STATES</b>	<b>545</b>
<b>MINNESOTA</b>	<b>542</b>
Canada	532
Israel	531
Latvia (LSS)	525

Slovak Republic	547
Switzerland	545
Netherlands	541
Slovenia	541
Austria	539
France	538
Hungary	537
Russian Federation	535
Australia	530
Ireland	527
Canada	527
Belgium-French	526
<b>MINNESOTA</b>	<b>525</b>
Bulgaria	522
Thailand	522
Israel	522
Sweden	519
Germany	509
New Zealand	508
England	506
Norway	503
Portugal	502
<b>UNITED STATES</b>	<b>500</b>
Scotland	498

(Australia)	522
(Slovenia)	512
<b>MINNESOTA</b>	<b>495</b>
(Germany)	495
Hungary	483
Czech Republic	469

Scotland	520
England	513
Cyprus	502
Norway	502
New Zealand	499
Greece	492
Thailand	490
Portugal	475
Iceland	474
Iran, Islamic Rep.	429
Kuwait	400

(Italy)	476
Russian Federation	471
Lithuania	469
<b>(UNITED STATES)</b>	<b>461</b>
Cyprus	446
(South Africa)	356

◀ = International Average

Latvia	493
Spain	487
Iceland	487
Greece	484
Romania	482
Lithuania	477
Cyprus	474
Portugal	454
Iran, Islamic Rep.	428
Kuwait	392
Columbia	385
South Africa	354

### Key to scores

◻ = scores significantly higher than MN

◻ = scores not significantly different from MN

◻ = scores significantly lower than MN

# Mean science scores—Minnesota comparison



## 4<sup>th</sup> Grade Science

Korea	597
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<b>MINNESOTA</b>	<b>577</b>
Japan	574
<b>UNITED STATES</b>	<b>565</b>
Austria	565
Australia	562

Netherlands	557
Czech Republic	557
England	551
Canada	549
Singapore	547
Slovenia	546
Ireland	539
Scotland	536
Hong Kong	533
Hungary	532
New Zealand	531
Norway	530
Latvia (LSS)	512
Israel	505
Iceland	505
Greece	497
Portugal	480
Cyprus	475
Thailand	473
Iran, Islamic Rep.	416
Kuwait	401

◀ = International Average

## 8<sup>th</sup> Grade Science

Singapore	607
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Czech Republic	574
Japan	571
Korea	565
Bulgaria	565
<b>MINNESOTA</b>	<b>565</b>
Netherlands	560
Slovenia	560
Austria	558
Hungary	554
England	552
Belgium-Flemish	550
Australia	545
Slovak Republic	544
Russian Federation	538
Ireland	538

Sweden	535
<b>UNITED STATES</b>	<b>534</b>
Germany	531
Canada	531
Norway	527
New Zealand	525
Thailand	525
Israel	524
Hong Kong	522
Switzerland	522
Scotland	517
Spain	517
France	498
Greece	497
Iceland	494
Romania	486
Latvia (LSS)	485
Portugal	480
Denmark	478
Lithuania	476
Belgium-French	471
Iran, Islamic Republic	470
Cyprus	463
Kuwait	430
Columbia	411
South Africa	326

## 12<sup>th</sup> Grade Science

Sweden	559
(Netherlands)	558
(Iceland)	549
(Norway)	544
(Canada)	532

New Zealand	529
(Australia)	527
Switzerland	523
(Austria)	520
(Slovenia)	517
<b>MINNESOTA</b>	<b>511</b>
(Denmark)	509
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# Contextual factors impacting 12<sup>th</sup>-grade achievement

From the data gathered by the TIMSS surveys administered during the spring of 1995 to administrators and students, the following contextual factors emerge. These factors provide an important context for considering the meaning of the student achievement score rankings.

## Student Opportunity to Learn

- In the Minnesota TIMSS survey, 44 percent of the senior-year students reported that they were enrolled in academic programs, 45 percent in the general education program, and only 11 percent in a vocational program. Most TIMSS countries have much lower rates of enrollment in ‘general’ education programs compared to either academic or vocational.
- Students enrolled in academic programs achieved higher mean scores than students in vocational or general education programs.
- Students in Minnesota had a lower percentage (54 percent) of plans for continuing at a four-year university or college than did students in the overall U.S. sample (69 percent).

## Classroom Factors Impacting Learning

- Calculator use is widespread among final-year students in most of the TIMSS countries. About 55 percent of Minnesota 12<sup>th</sup> graders reported daily use of calculators, matching the U.S. rate.
- Frequent use of calculators was positively related to higher scores. For Minnesota, students who reported daily use of calculators outscored students reporting infrequent use by 93 scale points.
- Computers are used far less than calculators in all the TIMSS countries. In the U.S., 58 percent of students reported at least weekly use of a computer. For Minnesota, the figure was lower at 45 percent.
- Computer use was not clearly related to higher math and science literacy scores.

## Instructional Approaches

- In the Minnesota 12th grade TIMSS results, higher student achievement appears to be consistently related to standards-based instruction. This was not true for the fourth and eighth grade data.
- In mathematics, students with higher achievement indicated that they were more likely to be taught with standards-based activities such as explaining reasoning behind an idea, analyzing relationships using tables, working on problems with no immediate solution, writing equations to represent relationships, and solving equations.
- In science, students with higher achievement were also more likely to experience more standards-based teaching such as explaining reasoning behind an idea, analyzing relationships using tables, charts, or graphs, working on problems with no immediate solution, writing explanations about what was observed, or applying models to data.

## Other Factors Impacting Learning

- Minnesota’s 12<sup>th</sup> graders spend less time on homework than the international average, but there is no correlation between amount of homework and achievement scores on the TIMSS tests.
- The U.S. students spend far more time working at a paid job than students in any other TIMSS country. In the U.S., 55 percent of the students reported working three or more hours per day. The Minnesota figure is 63 percent. Second to the U.S. is Canada, with 39 percent of its students reporting working three or more hours per day, and no other country exceeds 30 percent on this measure.
- There is a negative relationship between math/science achievement scores and the amount of time students spend at a paid job.
- Television watching is not generally a problem for Minnesota students, according to the TIMSS data, which show that Minnesota 12<sup>th</sup> graders report a relatively low average daily television-watching rate.

# Interpreting TIMSS—Some important considerations

In interpreting what the TIMSS data mean for mathematics and science education in Minnesota, it is important to remember the following caveats:

- The goal is not to imitate the education system of any particular country, but to try to better understand the relative strengths and weaknesses of our own educational practice and to give focus to our improvement efforts. As the U.S. Department of Education observed about TIMSS at the outset, “TIMSS is not an answer book, but a mirror through which we can see our own education system in international perspective.”
- TIMSS does not suggest any single factor or set of factors that fully explain why U.S. or Minnesota performance at 12<sup>th</sup> grade is low relative to other countries. It does, however, highlight important trends.
- By themselves, the rankings of nations by achievement scores tend to mean less than we typically think they do. On the other hand, the TIMSS data on differences in curriculum and instructional practice offer important clues about possibilities for changing our practice in ways that may significantly improve student achievement.
- TIMSS offers unparalleled benchmarking possibilities. Benchmarking is a systematic, data-based, and continuous process whereby an organization engages in self-study and compares its own practices with those of the leaders in the field in order to identify, adapt, and apply significantly better practices.

## Acknowledgements

This report was prepared by SciMath<sup>MN</sup> staff. Primary data sources include the following publications:

Lutkus, Anthony D., et. al. *Mathematics & Science Achievement in the Final Year of Secondary School in Minnesota: Results from IEA's Third International Mathematics and Science Study*. Prepared by Educational Testing Service under contract with Westat, Inc. December 1998.

Lawrenz, Frances and Huffman, Douglas. *Instructional Relationships Within the Third International Mathematics and Science Study (TIMSS) Data for Minnesota Twelfth Grade Students*. Center for Applied Research & Educational Improvement, University of Minnesota. September 1998.

*Pursuing Excellence: A Study of U.S. Twelfth-Grade Mathematics and Science Achievement in International Context*. National Center for Education Statistics, U.S. Department of Education. NCES 98-049. Washington, DC: U.S. Government Printing Office. February 1998.



# TIMSS conclusions and recommendations

1. Minnesota's performance on the 12<sup>th</sup> grade TIMSS assessments is consistent with trends identified in earlier reports but shows two particularly surprising results: participation rates that are significantly below the U.S. and international benchmarks, and a significant gender gap that was barely evident at grades four and eight.
2. Minnesota's performance on TIMSS is better than that of the U.S. overall but only mediocre by international standards.
3. The results for Minnesota and the U.S. at grade 12 are consistent with earlier results that showed:
  - The U.S. math and science curriculum lacks rigor, focus and coherence;
  - U.S. teachers demand less high-level thought of their math students than teachers in Germany and Japan;
  - School support systems—including the preparation and deployment of teachers as well as the attitudes of teachers, students and parents toward learning—contribute to the relatively lower performance of U.S. students on TIMSS.
4. In general, the TIMSS results call attention to qualities that the highest-performing countries share, namely:
  - High expectations for all students, not just those at the top ability levels;
  - System-wide standards (typically national standards), focused curricula, and uniform practice across the system (nation or state).
5. For Minnesota and the context of statewide graduation standards, at least a couple of clear messages emerge from the 12<sup>th</sup> grade TIMSS data:
  - Minnesota's low participation rate means that we are letting too many students leave high school without achieving math and science literacy at the international standard.
  - We risk further slippage if we abandon the higher expectations for all students that are embedded in Minnesota's Graduation Standards in math and science.

## Information on U.S. TIMSS

**National Library of Education** 1-800-424-1616

**National Center for Educational Statistics** 1-202-219-1333

**NCES U.S. TIMSS**  
[www.nces.ed.gov/timss](http://www.nces.ed.gov/timss)

**Boston College**  
[www.csteep.bc.edu/timss](http://www.csteep.bc.edu/timss)

**Michigan State University**  
[ustimss.msu.edu](http://ustimss.msu.edu)

**TIMSS-Forum**  
[www.rbs.org/eisenhower/resources/timss/forum.html](http://www.rbs.org/eisenhower/resources/timss/forum.html)

## Minnesota TIMSS information

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1500 Highway 36 West  
Roseville, MN 55113  
651-582-8852

**Web site:** [www.scimathmn.org](http://www.scimathmn.org)  
**E-mail:** [scimath-mn@informns.k12.mn.us](mailto:scimath-mn@informns.k12.mn.us)



SciMath<sup>MN</sup> is a statewide, public/private partnership that advocates and supports standards-based systemic improvements in the teaching and learning of K-12 science and mathematics. SciMath<sup>MN</sup> works to increase the education achievement and participation of all Minnesota students in science and mathematics by promoting standards-based policy, professional development and practice, and public awareness and engagement.