Overview

- Texas Journey of Math Assessment
- National Story of Math Assessment
- International Story of Math Assessment
- Sightseeing: STAAR, other states’ tests, NAEP, TIMSS Items
- Analysis and Implications
Texas Journey of Math Assessment
Texas Assessment of Academic Skills (TAAS)

Student Performance, TAAS Math (Grade 5)
Texas Assessment of Academic Skills (TAAS)

Student Performance, TAAS Math (Grade 8)
Texas Assessment of Academic Skills (TAAS)

Student Performance, TAAS Math (Exit Level)

- All
- African-American
- Hispanic
- White
- Low SES

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Texas Assessment of Knowledge and Skills (TAKS)

Student Performance, TAKS Math (Grade 5)

2003 2004 2005 2006 2007 2008 2009 2010

0 10 20 30 40 50 60 70 80 90 100

- All
- African-American
- Hispanic
- White
- Low SES
Texas Assessment of Knowledge and Skills (TAKS)

Student Performance, TAKS Math (Grade 8)


- All
- African-American
- Hispanic
- White
- Low SES

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Texas Assessment of Knowledge and Skills (TAKS)

Student Performance, TAKS Math (Grade 11)
State of Texas Assessment of Academic Readiness (STAAR)

Student Performance, STAAR Math (Grade 5)
State of Texas Assessment of Academic Readiness (STAAR)

Student Performance, STAAR Math (Grade 8)

- All
- African-American
- Hispanic
- White
- Low SES
State of Texas Assessment of Academic Readiness (STAAR)

Student Performance, STAAR Math (Algebra 1)

- All
- African-American
- Hispanic
- White
- Low SES
National Story of Math Assessment
National Assessment of Educational Progress (NAEP) – Grade 4
NAEP Grade 4 – State by State

NAEP Average Scale Score, Grade 4
NAEP – Grade 4

NAEP Comparison: Texas, National, and High-Performing States


- National
- Massachusetts
- Minnesota
- New Hampshire
- Indiana
- Texas
National Assessment of Educational Progress (NAEP) – Grade 8
NAEP – Grade 8

NAEP Comparison: Texas, National, and High-Performing States

- National
- Massachusetts
- Minnesota
- New Hampshire
- New Jersey
- Texas

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International Story of Math Assessment

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TIMSS

- Trends in International Mathematics and Science Studies
- Administered at Grade 4, 8, and 12
- Every 4 years, most recently in 2015
- 57 countries and 7 regions participated
TIMSS 2015, Grade 4

Average Scale Score by Country or Jurisdiction

Texas and Florida 4th grade NAEP scores were similar, so Texas would be with Florida.
TIMSS 2015, Grade 8

Average Scale Score by Country or Jurisdiction

Based on NAEP scores with Texas, Florida, and US avg., Texas would probably go here.
PISA

- Program for International Student Assessment
- Organization for Economic Cooperation and Development (OECD)
- Administered to 15-year-olds (Grade 10 in US)
- Every 3 years, most recently in 2015
- Over 70 countries and regions participated
PISA 2015, Grade 10

There is no direct comparison with high school scores in the US. Based on 8th grade NAEP, Texas might go here.
No one ever says to a teacher, “Wow, I remember that really cool worksheet we did!”

--Karen Karp, CAMT 2016 Opening Session

Sightseeing: STAAR, state test, NAEP, TIMSS Assessment Items
Grade 4: Perimeter
Texas: STAAR 2016

33. A rug shaped like a rectangle has a width of 3 m. The length of the rug is 2 m greater than its width. What is the perimeter of the rug in meters?
   A. 10 m
   B. 16 m
   C. 8 m
   D. 15 m

Massachusetts, 2015

The length and width of a field are shown in the diagram below.

Minnesota, Grade 3

19. The perimeter of a rectangle is 16 inches. Its length is 5 inches. What is its width?
   A. 3 inches
   B. 6 inches
   C. 11 inches
   D. 21 inches

a. What is the perimeter, in feet, of the field? Show or explain how you got your answer.

b. What is the area, in square feet, of the field? Show or explain how you got your answer.

Both the length and the width of the field will be increased by 10 feet.

c. What will be the new area, in square feet, of the field? Show or explain how you got your answer.
A rug shaped like a rectangle has a width of 3 m. The length of the rug is 2 m greater than its width. What is the perimeter of the rug in meters?

A. 10 m  
B. 16 m  
C. 8 m  
D. 15 m

If both the square and the triangle above have the same perimeter, what is the length of each side of the square?

A. 4  
B. 5  
C. 6  
D. 7
Grade 4: Perimeter

Texas: STAAR 2016

A rug shaped like a rectangle has a width of 3 m. The length of the rug is 2 m greater than its width. What is the perimeter of the rug in meters?

A. 10 m  
B. 16 m  
C. 8 m  
D. 15 m

TIMSS 2011

The school playground is a square. The playground is 100 meters long. Ruth walks all the way around the edge of the playground. How far does she walk?

A. 100 meters  
B. 200 meters  
C. 400 meters  
D. 10,000 meters
Grades 6-8: Equivalent Expressions

Texas: Grade 6 STAAR 2016

9 Which two expressions are equivalent?

A 4 + (3 \cdot y) and (4 + 3) \cdot y

B (18 \div y) + 10 and 10 + (y \div 18)

C 12 − (y \cdot 2) and 12 − (2 \cdot y)

D (10 − 6) \div y and 10 − (6 \div y)

Massachusetts, Grade 6, 2015

Mason wrote the expression shown below.

\[ 5(y + 2) \]

Write an expression that is equivalent to Mason’s expression.

Minnesota, Grade 8

13. Which property is used in the equation \[ mg + mh = m(g + h) \]?

A. Associative
B. Commutative
C. Distributive
D. Identity
9. Which two expressions are equivalent?

A. $4 + (3 \cdot y)$ and $(4 + 3) \cdot y$
B. $(18 \div y) + 10$ and $10 + (y \div 18)$
C. $12 - (y \cdot 2)$ and $12 - (2 \cdot y)$
D. $(10 - 6) \div y$ and $10 - (6 \div y)$

Which of the following is equal to $6(x + 6)$?

A. $x + 12$
B. $6x + 6$
C. $6x + 12$
D. $6x + 36$
E. $6x + 66$
Grade 8: Angle Measures in Triangles

Texas: STAAR 2016

Massachusetts, 2014 (no calculator)

Triangle *PQR*, triangle *RST*, and two angle measures are shown below.

Line segment *QT* intersects line segment *PS* at point *R*. What is the value of *x*?
24. Four triangles are shown.

Based on these triangles, which statement is true?

F. \( \angle w = 75^\circ \), because \( 45 + 60 = 105 \) and \( 180 - 105 = 75 \)
G. \( \angle w = 105^\circ \), because \( 180 - (45 + 60) = 75 \) and \( 180 - 75 = 105 \)
H. \( \angle w = 285^\circ \), because \( 45 + 60 = 105 \) and \( 105 + 180 = 285 \)
J. \( \angle w = 165^\circ \), because \( 180 - 60 = 120 \) and \( 120 + 45 = 165 \)

TIMSS 2011

In the figure above, what is the value of \( x \)?

A. 30°
B. 40°
C. 45°
D. 65°
Grade 8: Simultaneous Linear Functions

Texas: STAAR 2016

The graph models the linear relationship between the charge for a trip and the number of miles driven for two taxis.

Based on the graph, which statement appears to be true?

F The charge for a trip with a distance of 5 miles is $5 greater for Taxi 1 than for Taxi 2.
G The charge for a trip with a distance of 5 miles is $5 less for Taxi 1 than for Taxi 2.
H The charge for a trip with a distance of 5 miles is $20 for both Taxi 1 and Taxi 2.
J The charge for a trip with a distance of 5 miles cannot be determined for either Taxi 1 or Taxi 2.

Florida: FCAT 2.0 Sample Item

An economist is helping a paper company evaluate the demand for reams of paper at different selling prices. The point at which the supply and demand graphs intersect is referred to as market equilibrium.

The economist graphed the supply and demand equations shown below.
Demand equation: \( y = 0.11x + 12 \)
Supply equation: \( y = 0.11x - 2.7 \)

What is the price per ream, in dollars, of the market equilibrium?
Grade 8: Simultaneous Linear Functions

Texas: STAAR 2016

Massachusetts, 2016 (no calculator)

North Carolina (calculator)

What are the solutions to the system of equations below?

\[ \begin{align*}
3y &= x - 2 \\
y &= -2x + 4
\end{align*} \]

A system of equations is shown below.

\[ \begin{align*}
2x + 4y &= 0 \\
y &= \frac{1}{2}x - 3
\end{align*} \]

What is the x-value in the solution to the system of equations?

A. -3
B. -1.5
C. 1.5
D. 3
Analysis and Implications
Comparing Texas Students with Other States

- Texas students, at Grades 4 and 8, perform above the national average.
  - At Grade 8, that difference is not significant.
- States such as Massachusetts, Minnesota, and New Hampshire consistently outperform Texas. What are they doing that we aren’t?
  - Emphasizing problem-solving
  - Balancing conceptual development with skills development
Comparing Texas Students with Other States

- Since 2011, there has been a national downward trend in NAEP math scores. For Texas, Grade 8 scores are falling faster than the nation’s.
  - 2011: $5.4 billion budget cut for schools
  - State funding increases aren’t keeping pace with enrollment growth → reduction in spending per student
  - Personnel reduction (specialists and other human resources)
Comparing Texas Students with Other Nations

- At Grades 4 and 8, Texas is like the United States – not performing well, but not performing poorly.
- At Grade 10, Texas, like the United States, performs lower than the OECD average.
- What are the consistently high-performing countries (Singapore, South Korea, Japan, Taiwan, certain Chinese areas) doing that we aren’t? What can we learn from them?
- What mathematical processes (such as problem-solving) are high-performing countries using that we aren’t?
Thank You!

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