Shutesbury 2004 MCAS 4th Grade Math Item Analysis

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Overview

The graph below shows the average response to the 39 questions on the 2004 4th grade Math MCAS test at Shutesbury Elementary school. The state has not yet released the item analysis data for 2005 on its web site. These data show where our students are doing better and worse than the state average. Shutesbury students did considerably better than the state average on the topic of Measurement and considerably worse on the topic of Patterns, Relations, and Algebra.
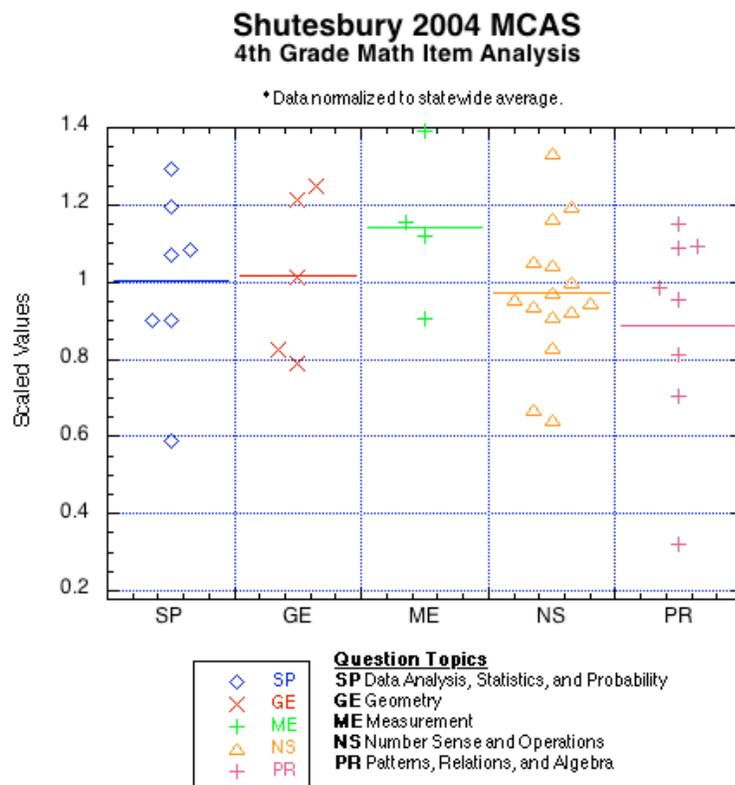
Data like these can be used to find out what areas of math students at Shutesbury are having trouble with. Each column on the graph represents one topic area in 4th grade math such as Geometry and Measurement. Each data marker represents one question and the average score Shutesbury students scored on that question. The data plotted have been normalized to the statewide Massachusetts average. This means that the statewide average is equivalent to 1.0. The horizontal lines indicate the mean value for the Shutesbury score in that topic.

For example look at the data point at the bottom of the column in Patterns, Relations, and Algebra (PR). That is question 11, it is a Short Answer question and has a value of 0.32. That means Shutesbury students scored only 1/3 of the state average for that question. Across the state 62% of the students answered that question correctly. At Shutesbury only 20% of the students answered it correctly. The scaled value of 0.32 is produced by dividing the Shutesbury average into the State average.

Questions We Had Difficulty With

The following is a list of 9 questions from the 2004 4th grade Math MCAS where Shutesbury students scored less than 0.9 when scaled against the Massachusetts average for that question. The questions are sorted from most incorrect to less incorrect.

Question #: 11
Question Type: Short Answer
Topic: Patterns, Relations, and Algebra
Shutesbury (correct): 20%
Massachusetts (correct): 62%
Scaled Value: 0.32

2004, QUESTION 11 - GRADE 04,

Write a rule for the input/output table shown below.

Input	7	1	5	9	13
Output	13	7	11	15	19

✓ Add 6 to input

Patterns, Relations, and Algebra

Only 20% of the students answered this question correctly however the other 80% actually skipped this question entirely.

Question #: 30
Question Type: Short Answer
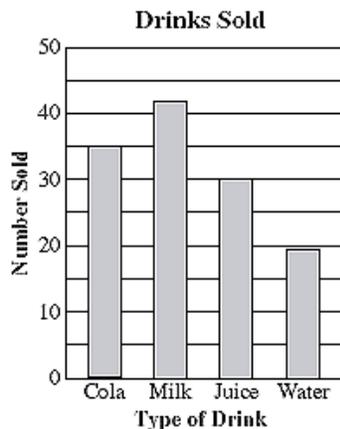Topic: Data Analysis, Statistics, and Probability
Shutesbury (correct): 36%
Massachusetts (correct): 61%
Scaled Value: 0.59

2004, QUESTION 30 - GRADE 04,

The graph below shows the number of four different types of drinks that were sold at a corner store on Monday.

Drinks Sold

Based on the information in the graph, what was the total number of drinks sold at the corner store on Monday?

✓ 124–127

Data Analysis, Statistics, and Probability

Only 36% of the students answered this question correctly however the other 64% actually skipped this question entirely.

Question #: 21
Question Type: Multiple Choice
Topic: Number Sense and Operations
Shutesbury (correct): 32%
Massachusetts (correct): 50%
Scaled Value: 0.64

2004, QUESTION 21 - GRADE 04,

Shannon read that fourteen thousand, nine hundred eighty–seven people live in Dukes County. Which of the following is another way to write this number?

✓ A. $10,000 + 4,000 + 900 + 80 + 7$

   B. $14,000,987$

   C. $14 \times 100 + 9 \times 10 + 87$

   D. $1 + 4 + 9 + 8 + 7$

Number Sense and Operations

64% of the students picked B.

Question #: 7
Question Type: Multiple Choice
Topic: Number Sense and Operations
Shutesbury (correct): 36%
Massachusetts (correct): 54%
Scaled Value: 0.67

2004, QUESTION 7 - GRADE 04,

Allan and Marie drove a total of 3184 miles in 8 days. They drove the same number of miles each day. Which of the following is closest to the number of miles they drove each day?

   A. 350

✓ B. 400

   C. 450

   D. 500

Number Sense and Operations

The incorrect responses were almost evenly divided between A, C, and D.

Question #: 19
Question Type: Multiple Choice
Topic: Patterns, Relations, and Algebra
Shutesbury (correct): 52%
Massachusetts (correct): 74%
Scaled Value: 0.70

2004, QUESTION 19 - GRADE 04,

Mr. Angelini paid $384 for a 4-night stay at the Peterborough Hotel. If the cost for each night was the same, how much did he pay for each night at the hotel?

    A. $90.60

    B. $91.00

    C. $92.50

✓ D. $96.00

Patterns, Relations, and Algebra

Most of the incorrect answers were B and C.

Question #: 17
Question Type: Open Response (4 point scale)
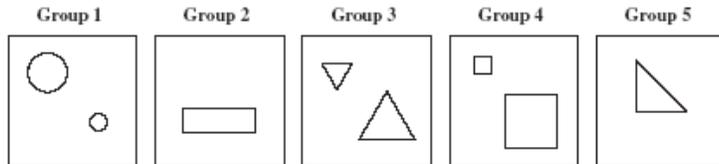Topic: Geometry
Shutesbury (correct): 1.80
Massachusetts (correct): 2.28
Scaled Value: 0.79

2004, QUESTION 17 - GRADE 04,

Natasha sorted eight shapes into five groups as shown below.

   Group 1   Group 2   Group 3   Group 4   Group 5

a. Explain how Natasha sorted the shapes into these groups.

b. Why do you think Natasha did not put the shape in Group 5 with the shapes in Group 3?

c. Which two groups could be combined? Explain your answer using geometric facts.

View Open Responses

Geometry

16% of the students skipped this question.

Question #: 3
Question Type: Multiple Choice
Topic: Patterns, Relations, and Algebra
Shutesbury (correct): 64%
Massachusetts (correct): 79%
Scaled Value: 0.81

2004, QUESTION 3 - GRADE 04,

The table below shows the total cost for different numbers of tickets to a special show at a water park. Each ticket costs the same amount.

Ticket Costs for Water Park Show

Number of Tickets	Total Cost
4	$16
9	$36
18	$72
21	$84

What is the total cost for 12 tickets to the show?

✓ A. $48
B. $44
C. $36
D. $24

Patterns, Relations, and Algebra

20 % of the students selected B.

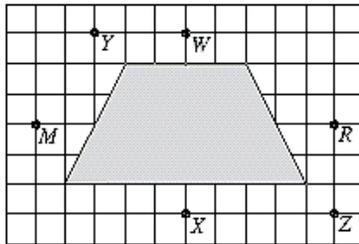Question #: 12
Question Type: Short Answer
Topic: Geometry
Shutesbury (correct): 52%
Massachusetts (correct): 63%
Scaled Value: 0.83

2004, QUESTION 12 - GRADE 04,

Which 2 points would both be on the line of symmetry for the shaded figure shown on the grid below?

✓ X and W

Geometry

All 48% of the students who got this question incorrect skipped it. Every student who answered the question got it right.

Question #: 2
Question Type: Multiple Choice
Topic: Number Sense and Operations
Shutesbury (correct): 64%
Massachusetts (correct): 77%
Scaled Value: 0.83

2004, QUESTION 2 - GRADE 04,

Gordon Stadium can seat 79,407 people, while Hillcrest Stadium seats only 58,868 people. How many more people can Gordon Stadium seat than Hillcrest Stadium?

     A.   138,275

     B.   21,549

     C.   21,461

✓ D.   20,539

Number Sense and Operations

20 % of the students selected C.

The data used for creating this report can be found at:

http://profiles.doe.mass.edu/mcas/mcasitems.asp?mcasyear=2004&district=272&school=&grade=04&subjectcode=MTH