

Shutesbury 2005 MCAS 4th Grade Math Item Analysis

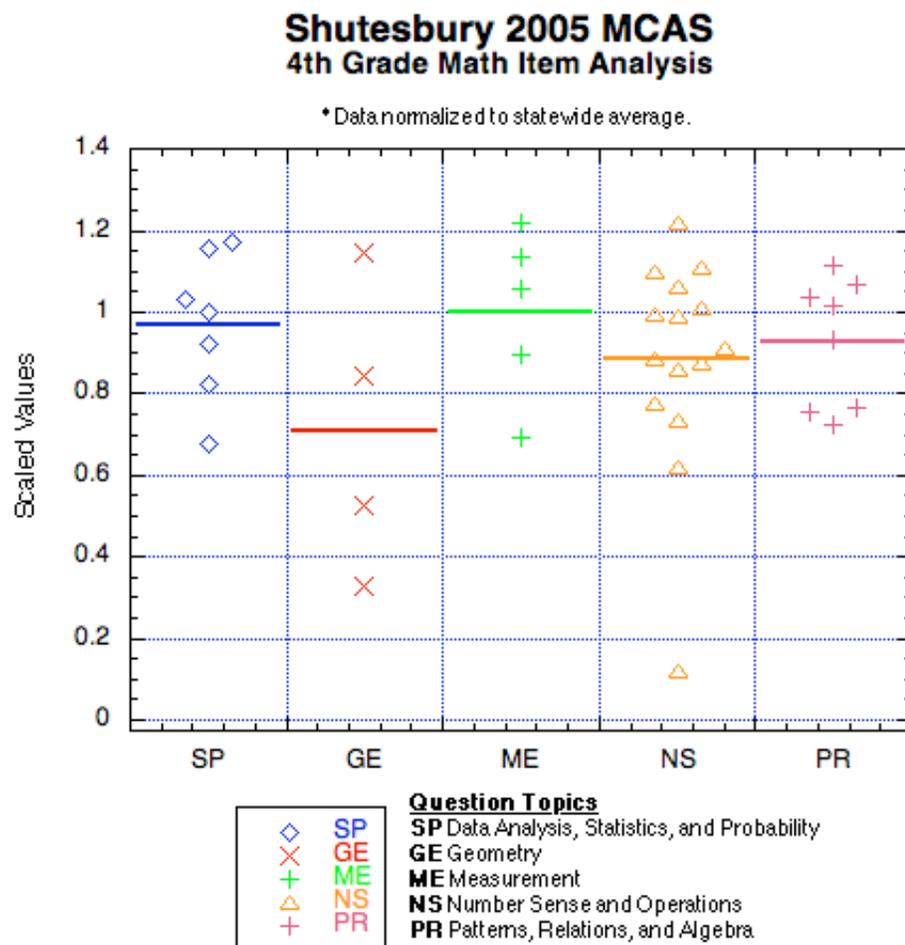
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Overview

The graph below shows the average response to the 39 questions on the 2005 4th grade Math MCAS test at Shutesbury Elementary school. These data show where our students are doing better and worse than the state average. Shutesbury students achieved close to the state average only on the topics of Measurement and Data Analysis, Statistics, and Probability. The other topics including Geometry, Number Sense, and Patterns, Relations, and Algebra were considerably below the state average.



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 average value for the Shutesbury score in that topic.

For example look at the data point at the bottom of the column in Number Sense (NS). That is question 15, it is a Multiple Choice question and has a value of 0.12. That means Shutesbury students scored approximately 1/10 of the state average for that question. Across the state 49% of the students answered that question correctly. At Shutesbury only 6% of the students answered it correctly. The scaled value of 0.12 is produced by dividing the Shutesbury average into the State average.

Questions We Had Difficulty With

The following is a list of 15 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 the one that the greatest number of students had incorrect to ones with lesser rates of incorrect answers.

Question #: 15

Question Type: Multiple Choice

Topic: Number Sense

Shutesbury (correct): 6%

Massachusetts (correct): 49%

Scaled Value: 0.12

Correct Answer: C

15 Which of the following is read "fifty-three hundredths"?

A. 5300

B. 53.00

C. 0.53

D. 0.053

61% selected B, 22% selected B, while only 6% selected the correct answer C.

Question #: 12

Question Type: Short Answer

Topic: Geometry

Shutesbury (correct): 17%

Massachusetts (correct): 52%

Scaled Value: 0.33

Use your MCAS ruler to answer question 12.

12 Draw a triangle with 1 obtuse angle.

83% of Shutesbury kids didn't answer this question. All the kids who answered the question got it right.

Question #: 25

Question Type: Multiple Choice

Topic: Geometry

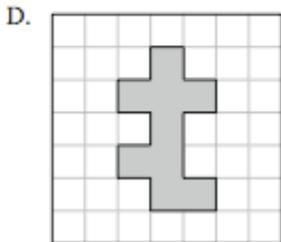
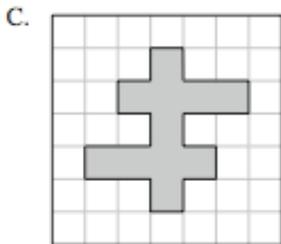
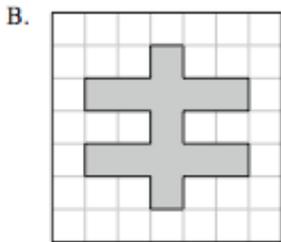
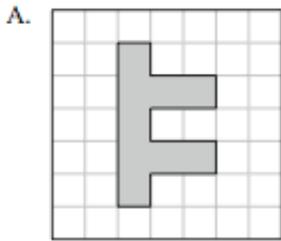
Shutesbury (correct): 33%

Massachusetts (correct): 63%

Scaled Value: 0.52

Correct Answer: A

- 25 Which of the shaded shapes shown below appears to have **exactly** 1 line of symmetry?



50% of the Shutesbury kids selected B which actually has 2 axes of symmetry.

Question #: 20

Question Type: Multiple Choice

Topic: Number Sense

Shutesbury (correct): 44%

Massachusetts (correct): 71%

Scaled Value: 0.62

Correct Answer: D

- 20** What is the remainder for the division problem shown below?

$$496 \div 6 = ?$$

- A. 0
- B. 1
- C. 3
- D. 4

33% selected D and 17% selected B.

Question #: 13

Question Type: Open Response

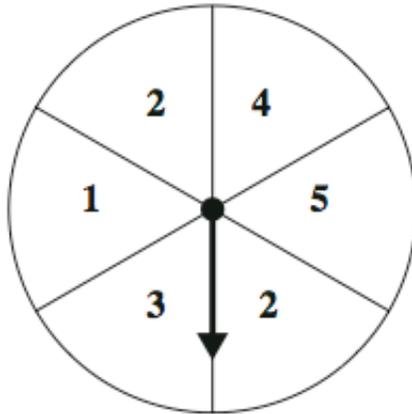
Topic: Data Analysis, Statistics, and Probability

Shutesbury (average): 1.50

Massachusetts (average): 2.21

Scaled Value: 0.68

- 13** Lark and Elroy are playing a game with a spinner like the one pictured below. All the sections of the spinner are the same size.



- a. If Lark spins the arrow 1 time, what is the probability that the arrow will land on a section labeled with the number 2? Show or explain how you got your answer.
 - b. If Elroy spins the arrow 1 time, what is the probability that the arrow will land on a section labeled with a number **greater than** 2? Show or explain how you got your answer.
 - c. Elroy earns a point if the arrow lands on a section labeled with an odd number. Lark earns a point if the arrow lands on a section labeled with an even number. Do Elroy and Lark each have an equal chance of winning, or does one of the players have a better chance of winning than the other? Explain the reason for your answer.
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Question #: 10

Question Type: Open Response

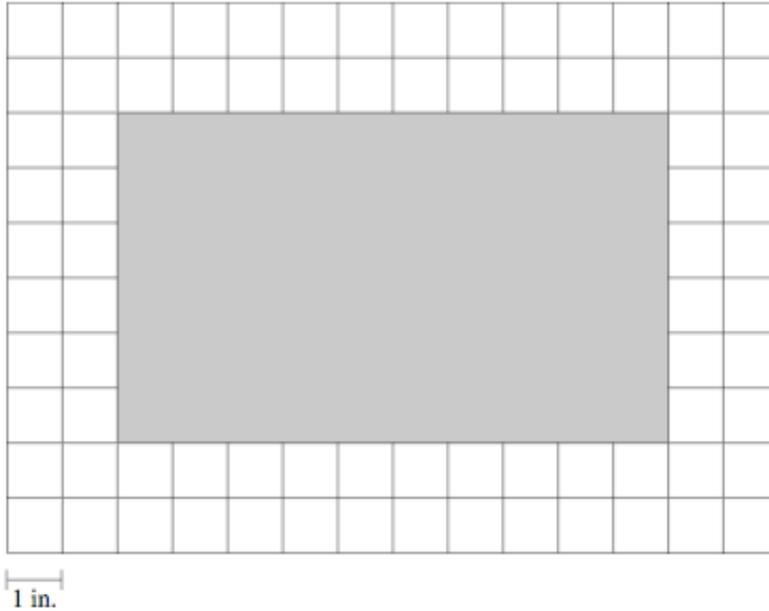
Topic: Measurement

Shutesbury (average): 1.44

Massachusetts (average): 2.08

Scaled Value: 0.69

- 10** Thyra has a rectangular piece of colored paper. The shaded shape on the grid below represents Thyra's piece of paper.



- What is the area, in square inches, of the piece of paper? Show your work or explain how you got your answer.
- What is the perimeter, in inches, of the piece of paper? Show your work or explain how you got your answer.
- Thyra cut the paper into 2 smaller rectangles that were each the same size. What is the perimeter, in inches, of each of the smaller rectangles? Show your work or explain how you got your answer.

Question #: 37

Question Type: Multiple Choice

Topic: Patterns, Relations, and Algebra

Shutesbury (correct): 39%

Massachusetts (correct): 54%

Scaled Value: 0.72

Correct Answer: C

- 37** Each new number in the pattern shown below was determined by adding the same value to the number just before it.

2, 9, 16, 23, . . .

If the pattern continues in the same way, what will be the 8th number?

- A. 30
- B. 46
- C. 51
- D. 56

39% selected A, 22% selected B.

Question #: 24

Question Type: Multiple Choice

Topic: Number Sense

Shutesbury (correct): 44%

Massachusetts (correct): 60%

Scaled Value: 0.73

Correct Answer: D

- 24** The chart below shows the height, in feet, of four different mountains in Colorado.

Mountain Heights

Mountain	Height (in feet)
Mt. Shavano	14,229
Mt. Antero	14,269
Mt. Cameron	14,238
Mt. Wilson	14,246

The height of Mt. Evans is between the two greatest heights shown on the chart above. Which of the following could be the height of Mt. Evans?

- A. 14,208 feet
- B. 14,241 feet
- C. 14,275 feet
- D. 14,264 feet

39% selected B.

Question #: 26

Question Type: Multiple Choice

Topic: Patterns, Relations, and Algebra

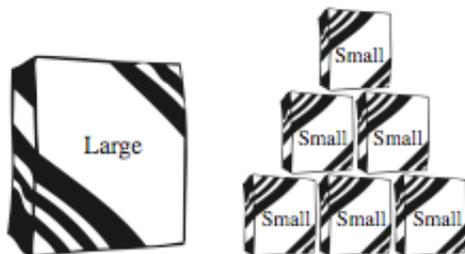
Shutesbury (correct): 61%

Massachusetts (correct): 81%

Scaled Value: 0.75

Correct Answer: C

- 26** One large box of cookies contains the same number of cookies as 6 small boxes. Each small box contains an equal number of cookies. The boxes of cookies are shown below.



A large box of cookies contains 84 cookies. What is the total number of cookies that a small box contains?

- A. 9
- B. 11
- C. 14
- D. 20

22% selected D.

Question #: 16

Question Type: Multiple Choice

Topic: Patterns, Relations, and Algebra

Shutesbury (correct): 56%

Massachusetts (correct): 73%

Scaled Value: 0.77

Correct Answer: A

- 16** What value for \triangle makes the number sentence shown below true?

$$\triangle + 4,123 = 32,085$$

- A. 27,962
- B. 28,962
- C. 32,162
- D. 36,208

33% selected B.

Question #: 22

Question Type: Multiple Choice

Topic: Number Sense

Shutesbury (correct): 56%
Massachusetts (correct): 72%
Scaled Value: 0.78
Correct Answer: C

- 22** Mr. Bingham wrote the correct answer to one of the homework problems on the board, as shown below.



Which of the following could have been the homework problem?

- A. 6×800
- B. 60×80
- C. 60×800
- D. 600×8

22% selected A, 22% selected B.

Question #: 39
Question Type: Multiple Choice
Topic: Data Analysis, Statistics, and Probability
Shutesbury (correct): 61%
Massachusetts (correct): 74%
Scaled Value: 0.82
Correct Answer: B

- 39 Libby planted seeds in each of the identical pots shown below. She planted seeds for pink flowers in 2 of the pots and seeds for yellow flowers in the rest of the pots.



Libby let Amy pick 1 pot. Amy picked her pot without knowing which seeds were planted in it. What is the probability that Amy's pot had seeds for pink flowers in it?

- A. $\frac{1}{11}$
B. $\frac{2}{11}$
C. $\frac{2}{9}$
D. $\frac{1}{2}$

22% selected A, 11% selected C.

Question #: 31

Question Type: Open Response

Topic: Geometry

Shutesbury (average): 2.06

Massachusetts (average): 2.44

Scaled Value: 0.84

Question 31 is an open-response question.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF THE QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 31 in the space provided in your Student Answer Booklet.

- 31** Ursula is drawing a map of the area near her school. The first part of her map is shown below. Copy Ursula's map into your Student Answer Booklet. Use your copy of the map to complete the following tasks.



- Rose Street is perpendicular to Oak Lane. On your map, draw Rose Street so that it is perpendicular to Oak Lane.
- Shady Glen is parallel to Rose Street. On your map, draw Shady Glen so that it is parallel to Rose Street.
- Broadway intersects Shady Glen to form an acute angle. Draw Broadway on your map. Mark the acute angle on your map.

Question #: 35

Question Type: Multiple Choice

Topic: Number Sense

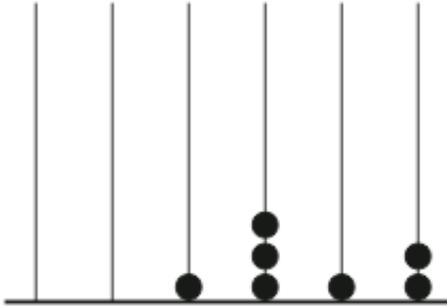
Shutesbury (correct): 61%

Massachusetts (correct): 71%

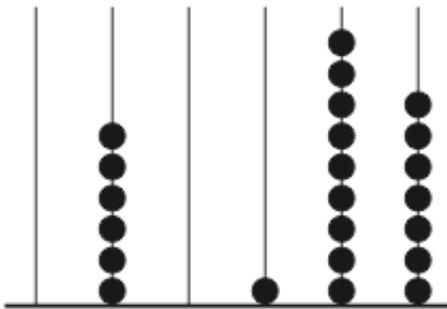
Scaled Value: 0.86

Correct Answer: B

- 35 The beads on the counting frame shown below represent the number 1,312.



Which number is represented by the beads on the counting frame below?



- A. 61,097
- B. 60,197
- C. 6,197
- D. 6,097

28% selected C.

Question #: 6

Question Type: Multiple Choice

Topic: Number Sense

Shutesbury (correct): 78%

Massachusetts (correct): 89%

Scaled Value: 0.88

Correct Answer: C

- 6 The chart below shows the number of college athletes who participated in four different sports in the academic year 1998–1999.

Sports Participation 1998–1999

Sport	Women	Men
Indoor Track	15,460	16,943
Outdoor Track	18,220	20,401
Soccer	17,520	18,238
Basketball	14,365	15,710

According to the chart, how many men and women participated in soccer in 1998–1999?

- A. 25,758
- B. 33,230
- C. 35,758
- D. 37,921

11% selected D. This was a question that a large majority of kids in Shutesbury and across the State got correct.

The data used for creating this report was produced by the Department of Education and supplied to me by Tari Thomas. At some point these data will be up on the DOE web site.