MEA 2007–2008

Mathematics Grade 4

The table below shows the entire MEA mathematics test design. Scores are based on common items only, half of which are released and can be found in this document.

Test Design

Content Area	Common			Embedded Field Test			Total Items per Student			Base Testing Time	Points
	MC	CR	SA	MC	CR	SA	MC	CR	SA		
Mathematics	32	1	6	8	1	2	40	2	8	105 min.	48

Each item on the MEA measures a grade level expectation based on Maine's 1997 *Learning Results*. Score points for items are accumulated and reported in clusters. Each content standard is included in a cluster as indicated below.

Mathematics Clusters

1. **Numbers and Operations**
   - Numbers and Number Sense (A)
   - Computation (B)
   - Discrete Mathematics (I)
2. **Shape and Size**
   - Geometry (E)
   - Measurement (F)
3. **Mathematical Decision Making**
   - Data Analysis and Statistics (C)
   - Probability (D)
4. **Patterns**
   - Patterns, Relations, and Functions (G)
   - Algebra Concepts (H)
   - Mathematical Communication (K)

Item Information Chart

Please refer to the item information chart on the next page for in-depth information on each mathematics released item. The released item numbers in the chart correspond to item numbers in the practice test and on the MEA Class Analysis Report.

Short-Answer and Constructed-Response Scoring Guides

A short-answer or constructed-response scoring guide includes score point descriptions used to determine the score. Training notes that follow the scoring guide provide in-depth descriptions or particular information also used to determine the score. At least one sample student response is provided for each score point with annotations that explain the reasoning behind the assigned score.

Student Work

Student work samples to supplement these scoring guides are found in the file labeled "Student Work."

Grade 4 Mathematics Released Item Information

Released Item Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Practice Test Page Number	2	2	2	3	3	3	3	4	4	5	6	6	7	9	9	9	9	9	10	10
Calculator	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y
Grade Level Expectation (GLE)	E2	E1	H1	K1	A1	G2	A2	F1	D2	C2	G1	I1	B1	B1	H2	F2	H2	E1	F1	E3
Cluster	2	2	4	4	1	4	1	2	3	3	4	1	1	1	4	2	4	2	2	2
Item Type	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	SA	SA	CR	MC	MC	MC	MC	MC	MC	SA
Possible Points	1	1	1	1	1	1	1	1	1	1	2	2	4	1	1	1	1	1	1	2
Answer Key	A	A	B	B	B	C	C	C	A	D				A	A	A	B	C	C	
% Who Chose A or Earned 1 Point	84	80	19	2	8	5	31	28	78	3	23	14	6	80	94	29	24	3	6	33
% Who Chose B or Earned 2 Points	3	10	36	89	83	5	3	9	2	11	65	37	25	8	5	42	53	7	7	46
% Who Chose C or Earned 3 Points	1	3	37	2	7	88	60	61	4	7			18	9	0	18	7	81	45	
% Who Chose D or Earned 4 Points	12	8	8	7	2	2	6	2	14	78			38	2	1	11	14	9	42	
Statewide Average Student Score											1.52	0.88	2.62							1.25

Calculator: This row indicates whether use of a calculator is allowed for this item.

Grade Level Expectation (GLE): See "State of Maine 2007 Grade Level Expectations for Grades 3–8" document available at the Maine Department of Education's Web site at http://www.maine.gov/education/lsalt/gles.htm.

Cluster: A group of content standards. (See previous page for groups.)

Item Type: MC = multiple-choice, SA = short-answer, CR = constructed-response

Answer Key: the letter of the correct answer choice

Short-Answer Item 11

11 Sarah walks for exercise. She records the number of minutes she walks in the table below.

Walking Time

Day	1	2	3	4	5	6
Minutes	6	12	18	24		

Sarah continues the pattern of walking times shown in the table.

a. How many minutes will she walk on Day 6?

b. What will be the first day that she walks for 60 minutes?

Be sure to label parts a and b in your answer booklet.

Scoring Guide for Short-Answer Item 11

Score	Description
2	Both parts correct.
1	One part correct.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

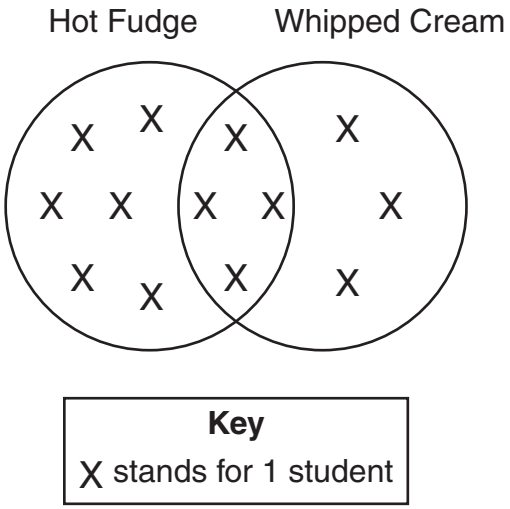
Training Notes for Short-Answer Item 11

a. 36 minutes

b. Day 10

Short-Answer Item 12

12 Mrs. Ryan's students made the Venn diagram below to show the toppings they put on their ice cream.



a. How many students put whipped cream on their ice cream?

b. Howard said, "Only six students put hot fudge on their ice cream." Do you agree with Howard? Explain why or why not.

Be sure to label parts a and b in your answer booklet.

Scoring Guide for Short-Answer Item 12

Score	Description
2	Student has a correct answer in part a, 7, and correct explanation in part b.
1	Student has a correct answer in part a only. OR Student has the correct explanation in part b only.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Training Notes for Short-Answer Item 12

Sample Responses:

Part b: Howard didn't count the students who put hot fudge and whipped cream on their ice cream. There are more than 6 Xs in the hot fudge circle.

Constructed-Response Item 13

13 The chart below shows the number of markers sold in small and large boxes.

Markers

Box Size	Number of Markers
Small	8
Large	16

Shawn bought 4 large boxes of markers.

a. How many markers did he buy altogether? Show or explain how you found your answer.

Catherine bought 4 small boxes of markers and 1 large box of markers.

b. How many markers did she buy altogether? Show or explain how you found your answer.

David bought some large and small boxes of markers. He bought a total of 40 markers.

c. Show one way he could have bought the 40 markers.

Be sure to label parts a, b, and c in your answer booklet.

Scoring Guide for Constructed-Response Item 13

Score	Description
4	5 points
3	4 points
2	2–3 points
1	1 point
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Training Notes for Constructed-Response Item 13

Part a:	2 points	correct answer, **64**, with work shown or explanation
	OR	
	1 point	correct answer, **64**, without work shown or explanation or correct strategy with computational error
Part b:	2 points	correct answer, **48**, with work shown or explanation
	OR	
	1 point	correct answer, **48**, without work shown or explanation or correct strategy with computational error
Part c:	1 point	correct answer or correct number combination

Sample Responses:

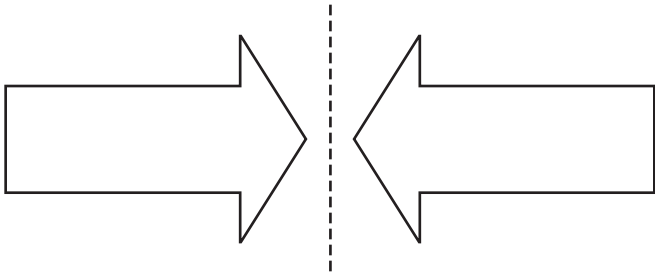
Part a: $16 \times 4 = 64$
$16 + 16 + 16 + 16 = 64$

Part b: $4 \times 8 = 32,\ 32 + 16 = 48$
$8 + 8 + 8 + 8 = 32,\ 32 + 16 = 48$

Part c: 1 small box of markers and 2 large boxes of markers
3 small boxes of markers and 1 large box of markers
$8 + 16 + 16 = 40$
$3 \times 8 = 24,\ 24 + 16 = 40$
$8 + 8 + 8 + 16 = 40$

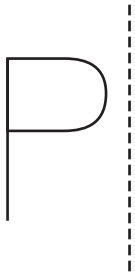
Short-Answer Item 20

20 Brendan moved the arrow shown below using a transformation:



a. What transformation did Brendan use to move the arrow?

Brendan used the same transformation to move the letter P shown below.



b. Copy the letter P and the dotted line in your answer booklet. Draw the letter after the transformation.

Be sure to label parts a and b in your answer booklet.

Scoring Guide for Short-Answer Item 20

Score	Description
2	Student correctly identifies the transformation (reflection or flip) AND correctly draws the flipped letter P.
1	Student correctly identifies the transformation (reflection or flip) OR correctly moves the letter P with the same transformation identified in part a.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Training Notes for Short-Answer Item 20

Correct answers:

Part a: The shape is flipped.

Part b: Student correctly flips the letter P—it is reversed left to right.

Note: Students must copy the original figure P and the line of reflection. If they do not, they cannot receive any credit. The reflected figure must have correct placement and orientation in respect to the original figure and line.