IX. Mathematics, Grade 3

Grade 3 Mathematics Test

The spring 2011 grade 3 MCAS Mathematics test was based on learning standards in the Massachusetts *Mathematics Curriculum Framework* (2000). The *Framework* identifies five major content strands, listed below. Specific learning standards for grade 3 are found in the *Supplement to the Massachusetts Mathematics Curriculum Framework* (2004). Page numbers for the grades 3–4 *Framework* learning standards and for the grade 3 *Supplement* standards appear in parentheses.

❚ Number Sense and Operations (*Framework*, pages 22–23; *Supplement*, pages 3–4)

❚ Patterns, Relations, and Algebra (*Framework*, page 32; *Supplement*, page 4)

❚ Geometry (*Framework*, page 40; *Supplement*, pages 4–5)

❚ Measurement (*Framework*, page 48; *Supplement*, page 5)

❚ Data Analysis, Statistics, and Probability (*Framework*, page 56; *Supplement*, pages 5–6)

The *Mathematics Curriculum Framework* and *Supplement* are available on the Department website at www.doe.mass.edu/frameworks/current.html.

In test item analysis reports and on the Subject Area Subscore pages of the MCAS *School Reports* and *District Reports*, Mathematics test results are reported under five MCAS reporting categories, which are identical to the five *Mathematics Curriculum Framework* content strands listed above.

Test Sessions

The MCAS grade 3 Mathematics test included two separate test sessions. Each session included multiple-choice, short-answer, and open-response questions. Approximately half of the common test items are shown on the following pages as they appeared in grade 3 test & answer booklets.

Reference Materials and Tools

Each student taking the grade 3 Mathematics test was provided with a plastic ruler and a grade 3 Mathematics Tool Kit. A copy of the tool kit pieces used by students to answer question 3 immediately follows the last question in this chapter. An image of the ruler is not reproduced in this publication.

The use of bilingual word-to-word dictionaries was allowed for current and former limited English proficient students only, during both Mathematics test sessions. No calculators, other reference tools, or materials were allowed.

Cross-Reference Information

The tables at the conclusion of this chapter indicate each released and unreleased common item's reporting category and the framework learning standard it assesses. The correct answers for released multiple-choice and short-answer questions are also displayed in the released item table.

Mathematics

SESSION 1

You may use your tool kit and MCAS ruler during this session.
*You may **not** use a calculator during this session.*

DIRECTIONS

This session contains eight multiple-choice questions, two short-answer questions, and one open-response question. For multiple-choice questions, mark your answers by filling in the circle next to the best answer. For the short-answer and open-response questions, write your answer in the space provided below the question.

1 Which of these is another way to write 3280?

Ⓐ 3 hundreds, 28 ones

Ⓑ 3 hundreds, 28 tens

Ⓒ 3 thousands, 28 ones

Ⓓ 3 thousands, 28 tens

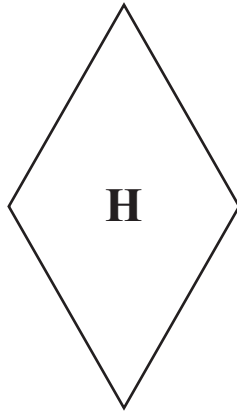**2** Li put 60 muffins into boxes. She put exactly 6 muffins in each box.

How many boxes did Li use?

Ⓐ 10

Ⓑ 12

Ⓒ 15

Ⓓ 20

Question 3 is a short-answer question. Write your answer to this question in the Answer Box provided.

You may use the shape labeled H *from your tool kit to answer question 3.*

3   Dana drew the shape shown below.

H

How many lines of symmetry does Dana's shape have? Write your answer in the Answer Box below.

Answer Box

3

Question 4 is a short-answer question. Write your answer to this question in the Answer Box provided.

4   What number belongs in the ⬚? below to make a true number sentence?

$$30 + \boxed{?} = 23 + 45 + 7$$

In the Answer Box below, write the missing number that makes the number sentence true.

Answer Box

> **4**

Mark your choices for multiple-choice questions 5 through 10 by filling in the circle next to the best answer.

5 Sanjiv bought two books at the book fair.

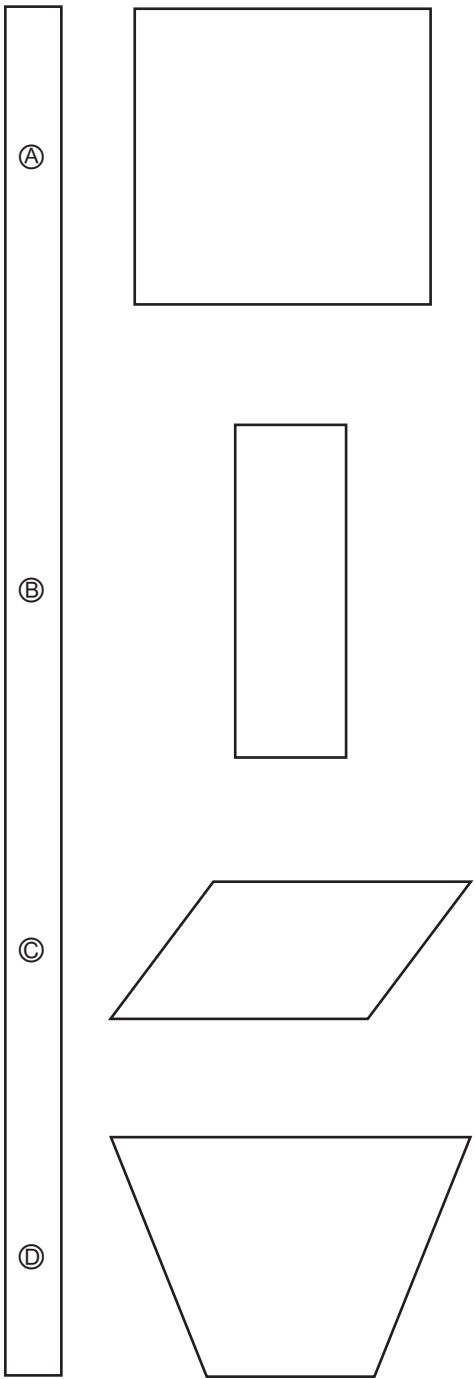- One book cost $3.19.
- The other book cost $5.80.

Which estimate is closest to the total cost of the two books?

Ⓐ $8

Ⓑ $9

Ⓒ $10

Ⓓ $11

6 Tom used tiles to make an ABBA pattern. Which of these could be the pattern that Tom made?

7 Which of these shapes has **exactly** one pair of parallel sides?

Ⓐ

Ⓑ

Ⓒ

Ⓓ

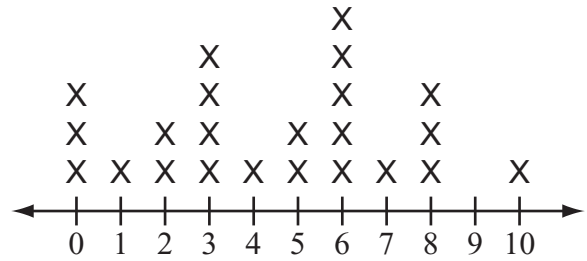**8** Andre wants to measure the weight of his backpack when it is full of books.

Which unit should Andre use?

Ⓐ pound

Ⓑ inch

Ⓒ foot

Ⓓ ton

9 Which list shows **all** the multiples of 6 that are between 1 and 20?

- Ⓐ 1, 2, 3, 6
- Ⓑ 1, 6, 20
- Ⓒ 6, 9, 12, 15
- Ⓓ 6, 12, 18

10 The line plot below shows the number of buttons on the clothes worn by each student in a class one day.

Number of Buttons on Clothes

How many students had **fewer than** 5 buttons on their clothes?

- Ⓐ 2
- Ⓑ 9
- Ⓒ 11
- Ⓓ 18

Write your answers to parts (a) and (b) of open-response question 11 in the spaces provided.

11   Ms. Gallo's class is solving the problem in the box below.

> - Emma had 26 stickers.
>
> - She gave some stickers to Janet.
>
> - Then Emma had 18 stickers left.
>
> - How many stickers did she give to Janet?

a. Write a number sentence using subtraction that matches the problem.

> This is a number sentence:
>
> $1 + 2 = 3$
>
> This is **not** a number sentence:
>
> $$\begin{array}{r} 1 \\ +2 \\ \hline 3 \end{array}$$

b. Write a number sentence using $>$ or $<$ that correctly compares the number of stickers Emma gave to Janet to the number of stickers Emma had left.

Mathematics

You may use your tool kit and MCAS ruler during this session.
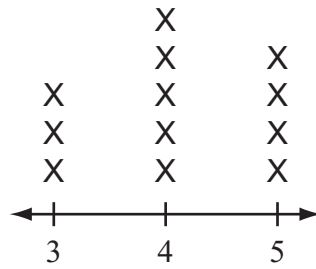*You may **not** use a calculator during this session.*

DIRECTIONS

This session contains five multiple-choice questions, one short-answer question, and one open-response question. For multiple-choice questions, mark your answers by filling in the circle next to the best answer. For the short-answer and open-response questions, write your answer in the space provided below the question.

12 Which letter has two line segments that are parallel?

Ⓐ K

Ⓑ L

Ⓒ N

Ⓓ V

13 The line plot below shows the number of hours Ms. Jackson's students practiced violin last week.

```
                X
                X       X
        X       X       X
        X       X       X
        X       X       X
      ◄─┼───────┼───────┼─►
        3       4       5
```

Number of Hours of Violin Practice

Which of these pictographs shows the same data as the line plot?

Violin Practice

Number of Hours	Number of Students
3	☺◖
4	☺☺◖
5	☺☺

Ⓐ

Key
☺ stands for 2 students

Violin Practice

Number of Hours	Number of Students
3	☺◖
4	☺☺
5	☺☺◖

Ⓒ

Key
☺ stands for 2 students

Violin Practice

Number of Hours	Number of Students
3	☺
4	☺☺☺
5	☺☺

Ⓑ

Key
☺ stands for 2 students

Violin Practice

Number of Hours	Number of Students
3	☺☺☺
4	☺☺☺☺☺
5	☺☺☺☺

Ⓓ

Key
☺ stands for 2 students

Question 14 is a short-answer question. Write your answer to this question in the Answer Box provided.

14 How many minutes are in $2\frac{1}{2}$ hours?

Write your answer in the Answer Box below.

Answer Box

14

Mark your choices for multiple-choice questions 15 through 17 by filling in the circle next to the best answer.

15 Which symbol belongs in the (?) below to make the number sentence true?

$$5 + 8 \; ⃝? \; 4 + 4 + 4$$

Ⓐ +

Ⓑ >

Ⓒ =

Ⓓ <

16 What is 443 rounded to the nearest hundred?

Ⓐ 400

Ⓑ 440

Ⓒ 450

Ⓓ 500

17　A store sells books.

- In January, the store sold 812 books.
- In February, the store sold 845 books.
- In March, the store sold more books than in January but fewer books than in February.

Which of these could be the number of books the store sold in March?

Ⓐ　834

Ⓑ　857

Ⓒ　810

Ⓓ　848

Write your answers to parts (a) and (b) of open-response question 18 in the spaces provided.

18   The chart below shows the shoes and socks that Maddy can choose to wear.

Shoes	Socks
	Gray (G)
Dress Shoes (D)	Lace (L)
Sneakers (S)	White (W)
	Zigzags (Z)

a. List **all** the different ways that Maddy can choose 1 kind of shoe and 1 kind of sock to wear.

b. What is the total number of different ways Maddy can choose 1 kind of shoe and 1 kind of sock?

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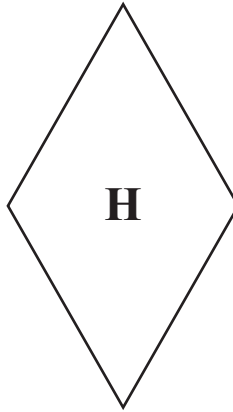
During testing, students were provided additional tool kit pieces to answer test items that are not released.

Grade 3 Mathematics
Spring 2011 Released Items:
Reporting Categories, Standards, and Correct Answers*

Item No.	Page No.	Reporting Category	Standard	Correct Answer (MC/SA)*
1	137	*Number Sense and Operations*	3.N.1	D
2	137	*Number Sense and Operations*	3.N.9	A
3	138	*Geometry*	3.G.6	2
4	139	*Number Sense and Operations*	3.N.7	45
5	140	*Number Sense and Operations*	3.N.12	B
6	140	*Patterns, Relations, and Algebra*	3.P.1	D
7	141	*Geometry*	3.G.1	D
8	141	*Measurement*	3.M.1	A
9	142	*Number Sense and Operations*	3.N.5	D
10	142	*Data Analysis, Statistics, and Probability*	3.D.3	C
11	143	*Patterns, Relations, and Algebra*	3.P.4	
12	144	*Geometry*	3.G.4	C
13	145	*Data Analysis, Statistics, and Probability*	3.D.2	A
14	146	*Measurement*	3.M.2	150 minutes
15	147	*Patterns, Relations, and Algebra*	3.P.2	B
16	147	*Number Sense and Operations*	3.N.11	A
17	148	*Number Sense and Operations*	3.N.2	A
18	149	*Data Analysis, Statistics, and Probability*	3.D.4	

* Answers are provided here for multiple-choice items and short-answer items only. Sample responses and scoring guidelines for open-response items, which are indicated by shaded cells, will be posted to the Department's website later this year.

Grade 3 Mathematics
Spring 2011 Unreleased Common Items:
Reporting Categories and Standards

Item No.	Reporting Category	Standard
19	*Measurement*	3.M.3
20	*Patterns, Relations, and Algebra*	3.P.2
21	*Data Analysis, Statistics, and Probability*	3.D.3
22	*Number Sense and Operations*	3.N.8
23	*Data Analysis, Statistics, and Probability*	3.D.1
24	*Number Sense and Operations*	3.N.12
25	*Number Sense and Operations*	3.N.6
26	*Measurement*	3.M.4
27	*Patterns, Relations, and Algebra*	3.P.4
28	*Patterns, Relations, and Algebra*	3.P.3
29	*Number Sense and Operations*	3.N.13
30	*Number Sense and Operations*	3.N.3
31	*Geometry*	3.G.6
32	*Data Analysis, Statistics, and Probability*	3.D.3
33	*Patterns, Relations, and Algebra*	3.P.1
34	*Measurement*	3.M.5
35	*Number Sense and Operations*	3.N.4
36	*Data Analysis, Statistics, and Probability*	3.D.2