

Massachusetts MCAS 2021
Grade 3 Math

Exam Materials
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Answer Key Materials
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MASSACHUSETTS DEPARTMENT OF
ELEMENTARY AND SECONDARY
EDUCATION

*Release of Spring 2021
MCAS Test Items*

from the

*Grade 3 Mathematics
Paper-Based Test*

June 2021

**Massachusetts Department of
Elementary and Secondary Education**

Grade 3 Mathematics

SESSION 1

This session contains 14 questions.

You may **not** use a calculator during this session.



Directions

Read each question carefully and then answer it as well as you can. You must record all answers in this Test & Answer Booklet.

For some questions, you will mark your answers by filling in the circles in your Test & Answer Booklet. Make sure you darken the circles completely. Do not make any marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely.

For other questions, you will need to fill in an answer grid. Directions for completing questions with answer grids are provided on the next page.

If a question asks you to show or explain your work, you must do so to receive full credit. Write your response in the space provided. Only responses written within the provided space will be scored.

Directions for Completing Questions with Answer Grids

1. Work the question and find an answer.
2. Enter your answer in the answer boxes at the top of the answer grid.
3. Print only one number or symbol in each box. Do not leave a blank box in the middle of an answer.
4. Under each answer box, fill in the circle that matches the number or symbol you wrote above. Make a solid mark that completely fills the circle.
5. Do not fill in a circle under an unused answer box.
6. If you need to change an answer, be sure to erase your first answer completely.
7. See below for examples of how to correctly complete an answer grid.

EXAMPLES

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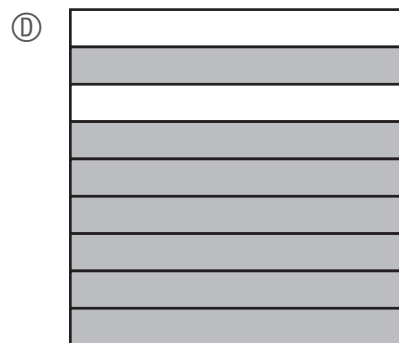
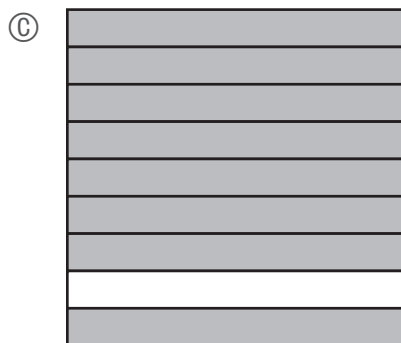
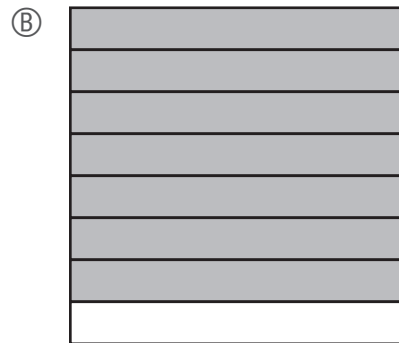
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- 1 What is the missing number that makes this equation true?

$$8 \times \boxed{?} = 48$$

- Ⓐ 6
- Ⓑ 7
- Ⓒ 40
- Ⓓ 56

- 2 Which of these shows $\frac{7}{8}$ of the fraction model shaded?



3 In which pair of equations are **both** equations true?

Ⓐ $7 \div 1 = 7$
 $1 \div 7 = 7$

Ⓑ $1 \div 7 = 7$
 $1 \times 7 = 7$

Ⓒ $7 \times 1 = 7$
 $1 \div 7 = 7$

Ⓓ $7 \times 1 = 7$
 $7 \div 1 = 7$

- 4 A dog owner gave his dog the same number of treats each day for 4 days. Over the 4 days, he gave his dog a total of 12 treats.

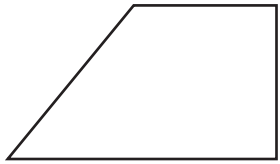
Which expression can be used to find the number of treats the dog owner gave his dog each day?

- Ⓐ $12 - 4$
- Ⓑ $12 + 4$
- Ⓒ $12 \div 4$
- Ⓓ 12×4

- 5 Which of these shapes appear to be rhombuses?

Select the **two** correct answers.

Ⓐ



Ⓑ



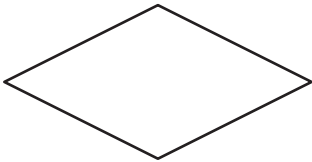
Ⓒ



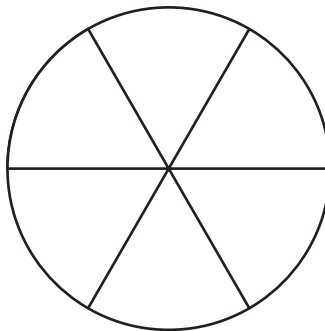
Ⓓ



Ⓔ



- 6 This circle is divided into equal parts.



What fraction of the area of the whole circle is one part?

Ⓐ $\frac{1}{1}$

Ⓑ $\frac{6}{1}$

Ⓒ $\frac{1}{6}$

Ⓓ $\frac{6}{6}$

This question has two parts.

7 A child spent time doing three activities after school.

- He spent 30 minutes doing homework.
- He spent 45 minutes doing chores.
- He spent 1 hour and 15 minutes playing outside.

Part A

How many **more** minutes did the child spend doing chores than doing homework? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

Part B

What is the total number of minutes the child spent doing all three activities? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

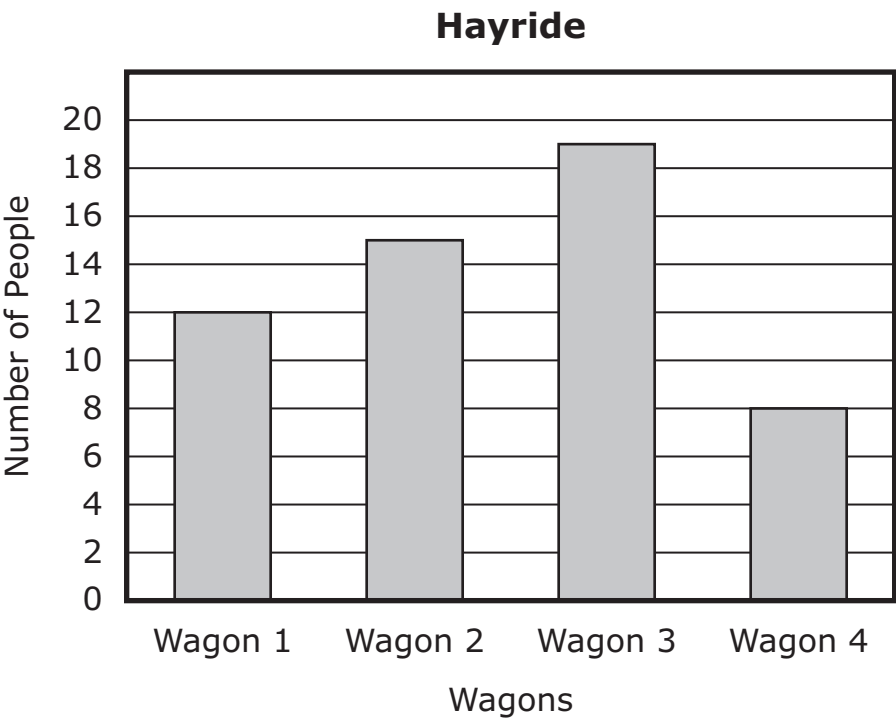
- 8 Use your ruler to answer question 8.

What is the length, to the nearest fourth of an inch, of this pencil?



- Ⓐ $4\frac{3}{4}$ inches
- Ⓑ $4\frac{1}{2}$ inches
- Ⓒ $4\frac{1}{4}$ inches
- Ⓓ 4 inches

- 9 People rode in four wagons during a hayride. This bar graph shows the number of people who were in each wagon.



The total number of people in wagons 1 and 4 was how much greater than the number in wagon 2?

Enter your answer in the answer boxes at the top of the answer grid **and** completely fill the matching circles.

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5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

This question has three parts.

- 10** A store owner recorded the amount of money, in dollars, he earned on each of three days, as shown in this table.

Money Earned Each Day

Day	Monday	Tuesday	Wednesday
Amount (dollars)	153	116	88

Part A

The store owner rounded the amount of money, in dollars, he earned on each day to the nearest hundred.

What is each amount in the table rounded to the nearest **hundred**?

Enter your answers in the space provided.

Part B

The store owner estimated the total amount of money, in dollars, he earned over the three days. He did this by first rounding the amount he earned each day to the nearest **ten** and then finding the total.

What was the owner's estimate of the **total** amount of money, in dollars, he earned over the three days? Show or explain how you got your estimate.

Enter your estimate and your work or explanation in the space provided.

Part C

On Thursday, the store owner rounded the amount of money, in dollars, he earned that day to the nearest **ten** and got 60.

What is the **greatest** amount of money, in dollars, the owner could have earned on Thursday? Explain how you got your answer.

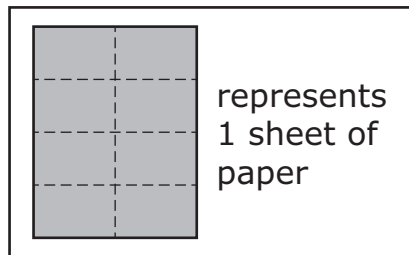
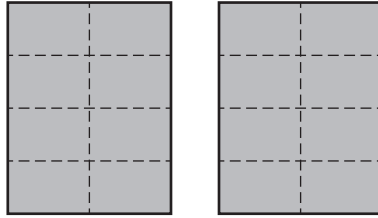
Enter your answer and your explanation in the space provided.

- 11** Janette had 32 pencils to share with 4 friends. She gave each friend the same number of pencils.

What is the total number of pencils Janette gave each friend?

- Ⓐ 36
- Ⓑ 28
- Ⓒ 8
- Ⓓ 7

- 12 A student folded 2 sheets of paper along dotted lines, as shown.



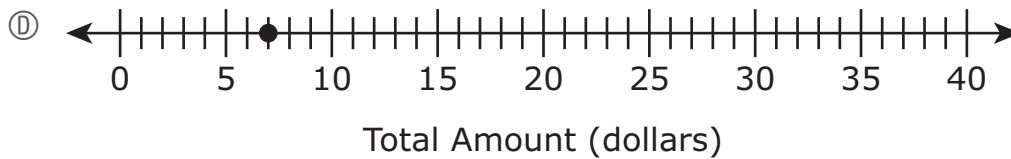
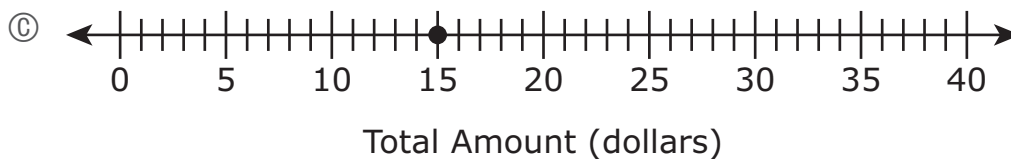
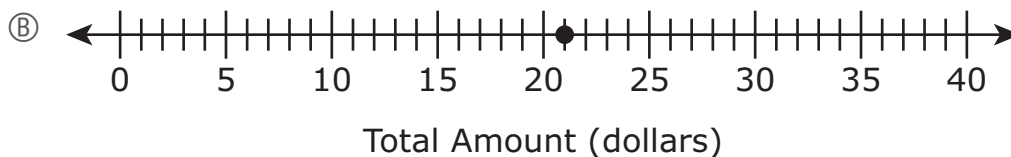
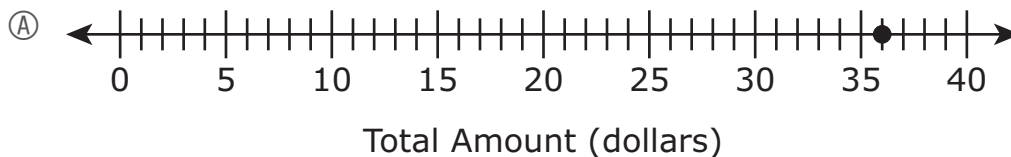
Which of these fractions also shows how many sheets of paper the student folded?

- Ⓐ $\frac{16}{8}$
- Ⓑ $\frac{16}{2}$
- Ⓒ $\frac{8}{8}$
- Ⓓ $\frac{8}{2}$

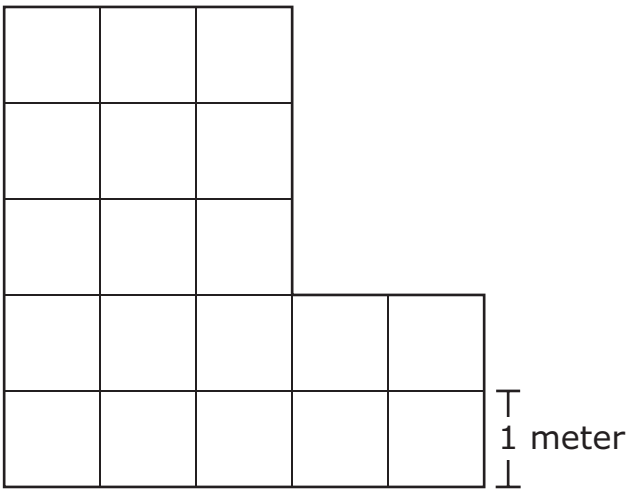
13 A group of 12 friends are going skating. Some of the friends will rent skates.

- 5 of the friends will **not** rent skates.
- The remaining friends will each rent skates for \$3.00.

Which of these number lines shows a point that represents the total amount, in dollars, the group will pay to rent skates?



- 14 The floor of a room is covered with square tiles, with no gaps or overlaps. Each square tile has a side length of 1 meter, as shown in this diagram.



What is the area, in square meters, of the floor of the room?

Enter your answer in the answer boxes at the top of the answer grid **and** completely fill the matching circles.

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7	7	7	7	7	7
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9	9	9	9	9	9

Grade 3 Mathematics

SESSION 2

This session contains 6 questions.

You may **not** use a calculator during this session.



Directions

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EXAMPLES

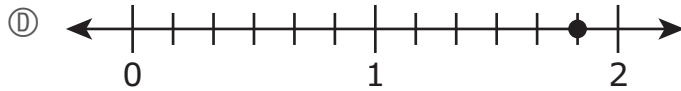
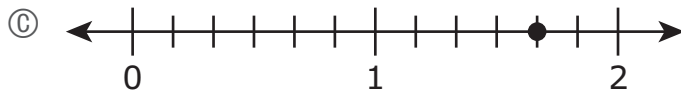
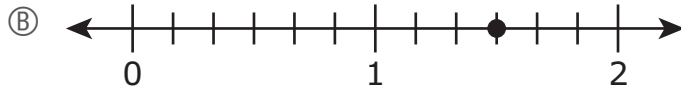
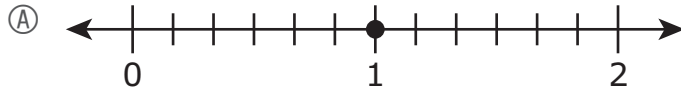
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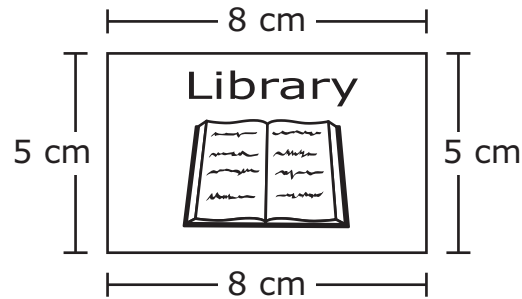
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- 15 Which of these number lines shows a point that represents the location of $\frac{10}{6}$?



- 16 A library card is in the shape of a rectangle. The library card and its side lengths are shown.



Which number sentence can be used to find the area, in square centimeters, of the library card?

- Ⓐ $5 + 8 = \square$
- Ⓑ $5 \times 8 = \square$
- Ⓒ $5 + 8 + 5 + 8 = \square$
- Ⓓ $5 \times 8 \times 5 \times 8 = \square$

- 17 Which sentence correctly compares the fractions $\frac{2}{8}$ and $\frac{2}{4}$?
- Ⓐ The fraction $\frac{2}{8}$ is equal to $\frac{2}{4}$ because both fractions have the same numerator.
 - Ⓑ The fraction $\frac{2}{4}$ is equal to $\frac{2}{8}$ because both fractions are equivalent to the fraction $\frac{1}{2}$.
 - Ⓒ The fraction $\frac{2}{8}$ is greater than $\frac{2}{4}$ because both fractions have the same numerator, and eighths are larger than fourths.
 - Ⓓ The fraction $\frac{2}{4}$ is greater than $\frac{2}{8}$ because both fractions have the same numerator, and fourths are larger than eighths.

- 18** A division equation is shown.

$$27 \div 3 = m$$

Which of these can also be used to find the value of m ?

- Ⓐ $m \div 27 = 3$
- Ⓑ $3 \div 27 = m$
- Ⓒ $m \times 3 = 27$
- Ⓓ $27 \times 3 = m$

- 19 The first four numbers in a pattern are shown.

39, 43, 47, 51, ?

Which of these sentences are true about the number pattern?

Select the **two** correct answers.

- Ⓐ The rule for the pattern is “add 3.”
- Ⓑ The rule for the pattern is “add 4.”
- Ⓒ The rule for the pattern is “subtract 6.”
- Ⓓ The next number in the pattern is 45.
- Ⓔ The next number in the pattern is 54.
- Ⓕ The next number in the pattern is 55.

- 20 An expression is shown.

$$5 \times 90$$

Which of these have the same value as the expression?

Select the **two** correct answers.

- Ⓐ 5×10
- Ⓑ 9×10
- Ⓒ 90×5
- Ⓓ $5 \times 9 \times 10$
- Ⓔ $90 \times 90 \times 90 \times 90 \times 90$

Grade 3 Mathematics
Spring 2021 Released Operational Items

PBT Item No.	Page No.	Reporting Category	Standard	Item Type*	Item Description	Correct Answer**
1	4	<i>Operations and Algebraic Thinking</i>	3.OA.A.4	SR	Determine the missing factor in a multiplication equation.	A
2	4	<i>Number and Operations-Fractions</i>	3.NF.A.1	SR	Identify a rectangle partitioned into equal parts and shaded to represent a given fraction in the form $\frac{a}{b}$.	B
3	5	<i>Operations and Algebraic Thinking</i>	3.OA.C.7	SR	Choose the pair of multiplication and/or division equations that are both true.	D
4	6	<i>Operations and Algebraic Thinking</i>	3.OA.A.2	SR	Determine which expression can be used to solve a word problem involving division of whole numbers.	C
5	7	<i>Geometry</i>	3.G.A.1	SR	Determine which shapes are a specific type of quadrilateral.	B,E
6	7	<i>Geometry</i>	3.G.A.2	SR	Determine the unit fraction that describes the area of one part of a circle that is partitioned into equal parts.	C
7	8–9	<i>Measurement and Data</i>	3.MD.A.1	CR	Solve word problems by finding time intervals using subtraction and addition.	
8	10	<i>Measurement and Data</i>	3.MD.B.4	SR	Select an appropriate ruler and measure a figure to the nearest fourth of an inch.	B
9	11	<i>Measurement and Data</i>	3.MD.B.3	SA	Use a scaled bar graph to solve a two-step "how many more" question.	5
10	12–14	<i>Number and Operations in Base Ten</i>	3.NBT.A.1	CR	Solve a word problem with estimation by rounding whole numbers to the nearest 10 and 100.	
11	15	<i>Operations and Algebraic Thinking</i>	3.OA.A.3	SR	Solve a word problem involving division of two whole numbers.	C
12	16	<i>Number and Operations-Fractions</i>	3.NF.A.3	SR	Identify an equivalent fraction using a given fraction model larger than one.	A
13	17	<i>Operations and Algebraic Thinking</i>	3.OA.D.8	SR	Solve a two-step word problem involving subtraction and multiplication and identify the solution on a number line.	B
14	18	<i>Measurement and Data</i>	3.MD.C.6	SA	Determine the area of an irregular shape by counting the square tiles that cover it.	19
15	21	<i>Number and Operations-Fractions</i>	3.NF.A.2	SR	Identify a given fraction greater than one on a number line.	C
16	22	<i>Measurement and Data</i>	3.MD.C.7	SR	Determine the equation that can be used to find the area of a figure with a given length and width.	B
17	23	<i>Number and Operations-Fractions</i>	3.NF.A.3	SR	Choose the statement that correctly compares two fractions with the same numerator.	D
18	24	<i>Operations and Algebraic Thinking</i>	3.OA.B.6	SR	Determine the multiplication equation that could be used to solve a given division equation.	C
19	25	<i>Operations and Algebraic Thinking</i>	3.OA.D.9	SR	Determine the rule and find the next number in a pattern.	B,F
20	26	<i>Number and Operations in Base Ten</i>	3.NBT.A.3	SR	Choose expressions that have the same value as a given expression in which a one-digit whole number is multiplied by a multiple of ten.	C,D

* Mathematics item types are: selected-response (SR), short-answer (SA), and constructed-response (CR).

**Answers are provided here for selected-response and short-answer items only. Sample responses and scoring guidelines for any constructed-response items will be posted to the Department's website later this year.

Grade 3 Mathematics
Spring 2021 Unreleased Operational Items

PBT Item No.	Reporting Category	Standard	Item Type*	Item Description
21	<i>Measurement and Data</i>	3.MD.C.5	SR	Determine the area of a figure given the number of square tiles that cover the figure and the side length of each tile.
22	<i>Number and Operations-Fractions</i>	3.NF.A.2	SR	Determine which fraction is represented by the location of a given point on a number line.
23	<i>Number and Operations in Base Ten</i>	3.NBT.A.2	SR	Compare three-digit whole numbers given in a table by subtracting.
24	<i>Number and Operations-Fractions</i>	3.NF.A.3	SR	Determine which fraction is equivalent to a given fraction.
25	<i>Operations and Algebraic Thinking</i>	3.OA.B.5	SR	Choose the pair of multiplication and/or division equations that are both true.
26	<i>Number and Operations in Base Ten</i>	3.NBT.A.3	SR	Identify products of one-digit whole numbers and multiples of ten.
27	<i>Geometry</i>	3.G.A.1	SR	Identify which mathematical name applies for a shape given the number of sides.
28	<i>Number and Operations in Base Ten</i>	3.NBT.A.2	SA	Add two three-digit whole numbers with regrouping.
29	<i>Number and Operations in Base Ten</i>	3.NBT.A.1	SR	Round whole numbers to the nearest 10.
30	<i>Measurement and Data</i>	3.MD.A.1	SR	Determine the time interval given starting and ending times shown on two different analog clocks.
31	<i>Measurement and Data</i>	3.MD.D.8	SR	Given a shape and its dimensions, determine which shape with different given dimensions has the same area but a different perimeter.
32	<i>Operations and Algebraic Thinking</i>	3.OA.A.1	CR	Solve a multiplication word problem, and write another word problem that can be solved with a given multiplication equation.
33	<i>Operations and Algebraic Thinking</i>	3.OA.C.7	SR	Solve multiplication equations with three whole number factors.
34	<i>Operations and Algebraic Thinking</i>	3.OA.D.8	SR	Determine which equation involving multiplication and addition can be used to solve a two-step problem.
35	<i>Operations and Algebraic Thinking</i>	3.OA.A.4	SR	Determine which multiplication and division equations are true when the unknown quantity is replaced with a given value.
36	<i>Number and Operations-Fractions</i>	3.NF.A.1	CR	Determine the fraction represented by a fraction model, justify your answer, and then create a fraction model of a fraction greater than one.
37	<i>Measurement and Data</i>	3.MD.A.2	SR	Multiply to solve a word problem involving liters.
38	<i>Measurement and Data</i>	3.MD.D.8	SR	Given the perimeter and some of the side lengths for several polygons, determine which polygons have a missing side length that is a specific amount.
39	<i>Geometry</i>	3.G.A.2	SR	Determine the unit fraction that describes the area of one part of a given shape that is partitioned into equal parts.
40	<i>Operations and Algebraic Thinking</i>	3.OA.A.3	SR	Determine which equation represents a word problem with division of whole numbers.

* Mathematics item types are: selected-response (SR), short-answer (SA), and constructed-response (CR).