Rhode Island RICAS 2023
Grade 5 Math

Reference Materials
Page 2

Exam Materials
Pages 3 - 23

Answer Key Materials
Pages 24 - 26

RIDE Rhode Island Department of Education

Rhode Island Comprehensive Assessment System
Grade 5 Mathematics Reference Sheet

CONVERSIONS

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts

1 mile = 5280 feet
1 mile = 1760 yards

1 pound = 16 ounces
1 ton = 2000 pounds

AREA (*A*) FORMULAS

square . . . . . $A = s \times s$
(s = length of a side)

rectangle . . . . . $A = b \times h$
(b = length of base; h = height)
OR
$A = l \times w$
(l = length; w = width)

VOLUME (*V*) FORMULAS

right rectangular prism . . . . $V = l \times w \times h$
(l = length; w = width; h = height)
OR
$V = B \times h$
(B = area of base; h = height)

RIDE Rhode Island Department of Education

Release of Spring 2023 RICAS Test Items

from the

Grade 5 Mathematics Paper-Based Test

June 2023
Rhode Island Department of Education

Overview of Grade 5 Mathematics Test

The spring 2023 grade 5 Mathematics test was a next-generation assessment that was administered in two formats: a computer-based version and a paper-based version. Most students took the computer-based test. The paper-based test was offered as an accommodation for eligible students who were unable to use a computer. More information can be found on the MCAS Test Administration Resources page at www.doe.mass.edu/mcas/admin.html.

Most of the operational items on the grade 5 Mathematics test were the same, regardless of whether a student took the computer-based version or the paper-based version. In places where a technology-enhanced item was used on the computer-based test, an adapted version of the item was created for use on the paper test. These adapted paper items were multiple-choice, multiple-select, or short-answer items that tested the same Mathematics content and assessed the same standard as the technology-enhanced item.

This document displays released items from the paper-based test. Released items from the computer-based test are available on the RICAS Resource Center website at ricas.pearsonsupport.com/released-items.

Test Sessions and Content Overview

The grade 5 Mathematics test was made up of two separate test sessions. Each session included selected-response, short-answer, and constructed-response questions. On the paper-based test, the selected-response questions were multiple-choice items and multiple-select items, in which students select the correct answer(s) from among several answer options.

Standards and Reporting Categories

The grade 5 Mathematics test was based on standards in the five major domains for grade 5 in the *Massachusetts Curriculum Framework for Mathematics* (2017). The five major domains are listed below.

- Operations and Algebraic Thinking
- Number and Operations in Base Ten
- Number and Operations—Fractions
- Measurement and Data
- Geometry

The *Massachusetts Curriculum Framework for Mathematics* is available on the Department website at www.doe.mass.edu/frameworks/current.html.

Mathematics test results are reported under five MCAS reporting categories, which are identical to the five framework domains listed above.

The tables at the conclusion of this document provide the following information about each released and unreleased operational item: reporting category, standard(s) covered, item type, and item description. The correct answers for released selected-response and short-answer questions are also displayed in the released item table.

Reference Materials and Tools

Each student taking the paper-based version of the grade 5 Mathematics test was provided with a plastic ruler and a grade 5 Mathematics Reference Sheet. A copy of the reference sheet follows the final question in this document. An image of the ruler is not reproduced in the document.

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

Grade 5 Mathematics

SESSION 1

This session contains 11 questions.

You may use your reference sheet during this session.
*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.

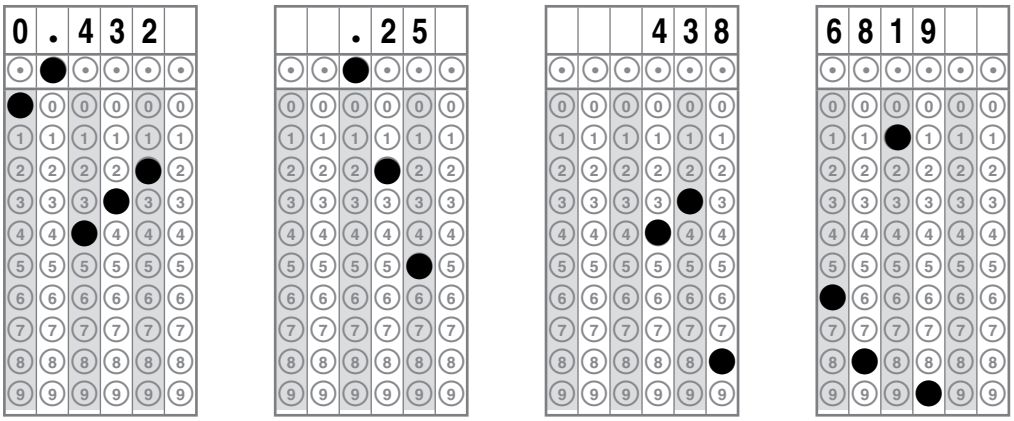
For other questions, you will need to fill in an answer grid. Directions for completing questions with answer grids are provided on the next page.

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



1 Which of the following values belong in the ? to make this statement true?

$$11 \times \frac{?}{5} \text{ is greater than } 11.$$

Select the **three** correct answers.

Ⓐ 3

Ⓑ 7

Ⓒ 8

Ⓓ 4

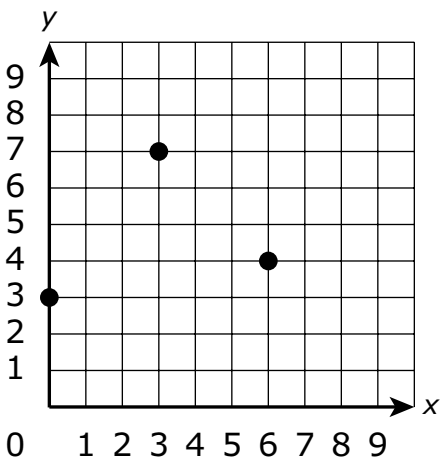
Ⓔ 6

Ⓕ 5

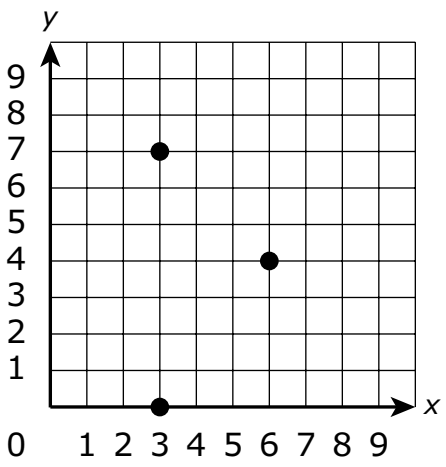
2 The vertices of a triangle are represented by the ordered pairs (0, 3), (3, 7), and (6, 4).

Which of the following shows the vertices of the triangle?

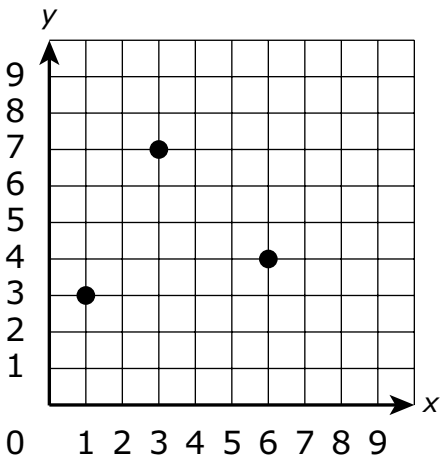
Ⓐ



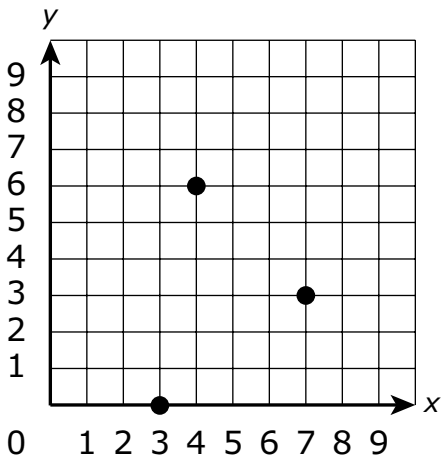
Ⓑ



Ⓒ



Ⓓ



3 A number is shown.

15.837

Which of the following shows the number rounded to the nearest **hundredth**?

Ⓐ 15.8

Ⓑ 15.9

Ⓒ 15.83

Ⓓ 15.84

4 The value of the 4 in 62.43 is how many times the value of the 4 in 75.34?

Ⓐ $\frac{1}{10}$

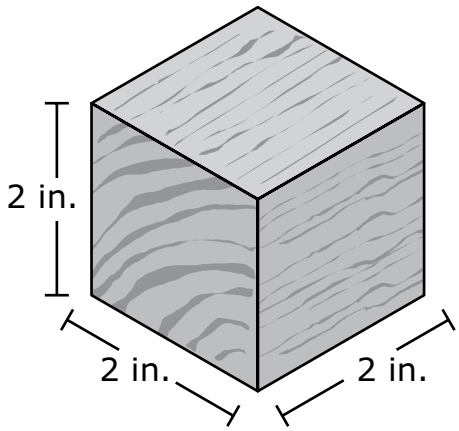
Ⓑ $\frac{1}{100}$

Ⓒ 10

Ⓓ 100

This question has four parts. Be sure to label each part of your response.

5 A toy company produces wooden blocks. Each block is in the shape of a cube with an edge length of 2 inches (in.), as shown in this diagram.



A. What is the volume, in cubic inches, of each block? Show or explain how you got your answer.

B. The toy company packs the blocks in cartons. Each carton is in the shape of a right rectangular prism and is completely filled, with no gaps or overlaps.

- The carton has a base area of 240 square inches.
- The carton has a height of 12 inches.

What is the volume, in cubic inches, of the carton? Show or explain how you got your answer.

C. What is the greatest number of blocks that can fit in one carton, with no gaps or overlaps? Show or explain how you got your answer.

D. The toy company plans to start making a larger carton that holds exactly 1,000 blocks, with no gaps or overlaps.

What could be the measurements, in inches, of the larger carton's length, width, **and** height? Show or explain how you got your answers.

Write your answers on the next page.

5

6 Which of the following shows three comparison statements that are **all** true?

Ⓐ
$2.150 = 2.15$
$1.071 < 1.09$
$5.714 < 5.8$

Ⓑ
$2.150 = 2.15$
$1.071 > 1.09$
$5.714 < 5.8$

Ⓒ
$2.150 > 2.15$
$1.071 > 1.09$
$5.714 > 5.8$

Ⓓ
$2.150 < 2.15$
$1.071 < 1.09$
$5.714 > 5.8$

7 A teacher wrote this expression to solve a math problem.

$$4 \div \frac{1}{12}$$

Which of the following could be the problem the teacher is solving?

Ⓐ An athlete will run 4 miles and then walk $\frac{1}{12}$ mile more. What is the total number of miles the athlete will run and walk?

Ⓑ A group of friends will share 4 whole pies. Each friend will receive $\frac{1}{12}$ of a whole pie. What is the total number of friends that will receive a piece of pie?

Ⓒ A person will work a total of 4 hours this weekend. The person will work $\frac{1}{12}$ hour on Saturday. What is the total number of hours the person will work on Sunday?

Ⓓ A cook will use eggs in 4 recipes this week. The cook will use $\frac{1}{12}$ of a carton of eggs in each recipe. What is the total number of cartons of eggs the cook will use this week?

This question has four parts. Be sure to label each part of your response.

8 The Star Ticket Company and the Best Ticket Company are both selling tickets to a game.

A. The Star Ticket Company charges $8 per ticket plus one $20 handling fee per order.

Complete the table provided in your answer space to show the total costs, in dollars, of purchasing different numbers of tickets from the Star Ticket Company.

B. The Best Ticket Company charges $10 per ticket plus one $7 handling fee per order.

Complete the table provided in your answer space to show the total costs, in dollars, of purchasing different numbers of tickets from the Best Ticket Company.

C. What is the difference between the total costs, in dollars, of purchasing 5 tickets with a handling fee from the Star Ticket Company and purchasing 5 tickets with a handling fee from the Best Ticket Company? Show or explain how you got your answer.

D. Will either the Star Ticket Company or the Best Ticket Company **always** have the least total cost, in dollars, for **any** number of tickets? Explain how you know your answer is correct.

Write your answers on the next page.

8 A.

Star Ticket Company

Number of Tickets	Total Cost Per Order ($)
1	28
2	36
3	
4	

B.

Best Ticket Company

Number of Tickets	Total Cost Per Order ($)
1	17
2	27
3	
4	

C. _____

D. _____

9 Which of the following tables shows equivalent numbers in exponential form **and** number form?

Ⓐ

Exponential Form	Number Form
10^6	1,000,000
10^0	10
10^5	100,000
10^2	100
10^3	1,000

Ⓑ

Exponential Form	Number Form
10^6	1,000,000
10^1	10
10^5	100,000
10^2	100
10^3	1,000

Ⓒ

Exponential Form	Number Form
10^6	1,000,000
10^1	10
10^5	100,000
10^2	100
10^4	1,000

Ⓓ

Exponential Form	Number Form
10^6	1,000,000
10^2	10
10^5	10,000
10^3	100
10^4	1,000

10 A number written in expanded form is shown.

$$\left(2 \times 100\right) + \left(5 \times 1\right) + \left(1 \times \frac{1}{10}\right) + \left(7 \times \frac{1}{100}\right)$$

Which of the following numbers in **word** form is equivalent to the number in expanded form?

Ⓐ two hundred five and seven hundredths

Ⓑ two hundred fifty and seven hundredths

Ⓒ two hundred five and seventeen hundredths

Ⓓ two hundred fifty and seventeen hundredths

This question has two parts.

11 A class is studying the attributes of shapes.

Part A

One student drew a rhombus.

Which of the following statements about rhombuses is true?

Ⓐ **All** rhombuses are rectangles, but only **some** rhombuses are squares.

Ⓑ **All** rhombuses are quadrilaterals, but only **some** rhombuses are squares.

Ⓒ **All** rhombuses are squares, but only **some** rhombuses are parallelograms.

Ⓓ **All** rhombuses are quadrilaterals, but only **some** rhombuses are parallelograms.

Part B

Another student drew a shape with these attributes:

- 4 sides
- all sides equal in length
- no right angles

Which of the following mathematical names could describe the student's shape?

Select the **three** correct answers.

Ⓐ quadrilateral

Ⓑ parallelogram

Ⓒ rectangle

Ⓓ rhombus

Ⓔ square

Grade 5 Mathematics

SESSION 2

This session contains 9 questions.

You may use your reference sheet during this session.
*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.

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12 An expression is shown.

$$(1 + 5) + 4 \times (8 - 2) \div 2$$

What is the value of the expression?

Ⓐ 18

Ⓑ 21

Ⓒ 30

Ⓓ 39

13 Which expression is equivalent to $\frac{7}{8}$?

Ⓐ 7×8

Ⓑ $7 \div 8$

Ⓒ $8 + 7$

Ⓓ $8 - 7$

14 Find the quotient.

$$1.33 \div 7$$

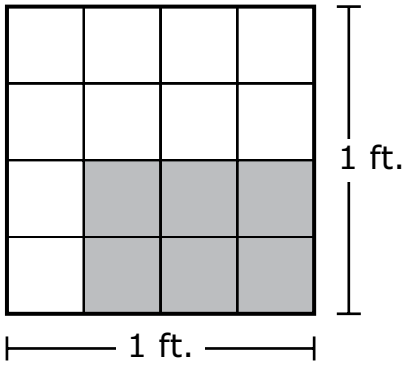
Ⓐ 19

Ⓑ 1.9

Ⓒ 0.19

Ⓓ 0.019

15 A square with a side length of 1 foot (ft.) is divided into equal parts, as shown.



What is the area, in square feet, of the **shaded** part of the square?

Ⓐ $\frac{6}{4}$

Ⓑ $\frac{6}{10}$

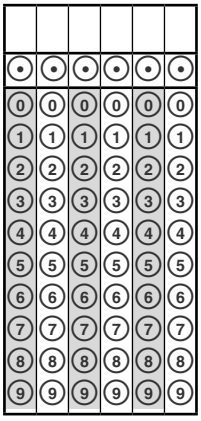
Ⓒ $\frac{6}{16}$

Ⓓ 6

16 Vivienne bought 6 packages of cheese for a party. Each package of cheese weighs 8 ounces.

What is the total weight, in **pounds**, of the cheese Vivienne bought for the party?

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



17 One cup of trail mix contains $\frac{1}{3}$ pound of dried fruit. Riley has $7\frac{1}{2}$ cups of the trail mix.

What is the total amount, in pounds, of dried fruit in Riley's trail mix?

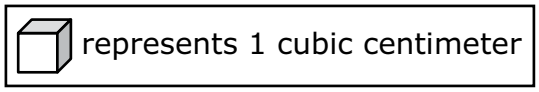
Ⓐ $3\frac{1}{6}$

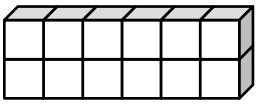
Ⓑ $2\frac{1}{2}$

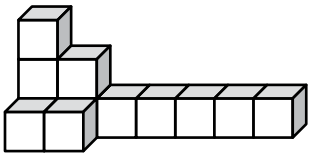
Ⓒ $2\frac{1}{3}$

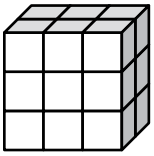
Ⓓ $1\frac{1}{6}$

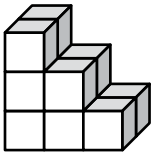
18 Which of the following figures has a volume greater than 15 cubic centimeters?



Ⓐ 

Ⓑ 

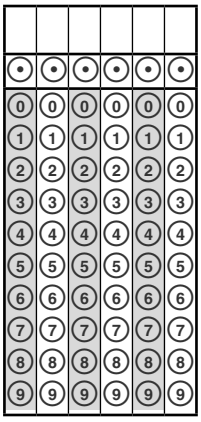
Ⓒ 

Ⓓ 

19 Find the quotient.

$$6{,}880 \div 32$$

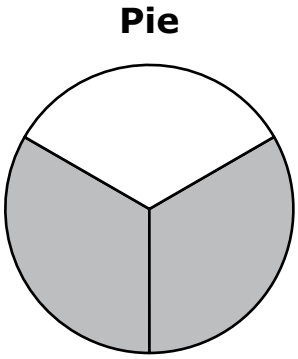
Enter your answer in the answer boxes at the top of the answer grid **and** completely fill the matching circles.



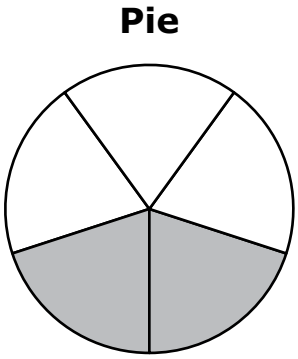
20 A child ate $\frac{1}{2}$ of an apple pie, and her sister ate $\frac{1}{3}$ of the same pie.

In which of the following fraction models does the shaded part show the **total** fraction of the pie eaten by the two sisters?

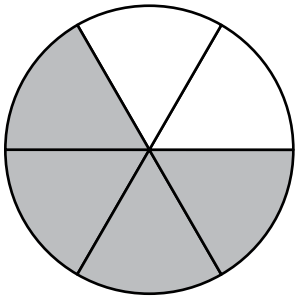
Ⓐ



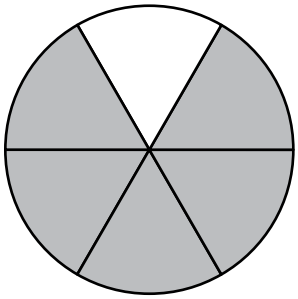
Ⓑ



Ⓒ



Ⓓ



Grade 5 Mathematics
Spring 2023 Released Operational Items

PBT Item No.	Page No.	Reporting Category	Standard	Item Type*	Item Description	Correct Answer**
1	4	*Number and Operations—Fractions*	5.NF.B.5	SR	In a multiplication problem involving a whole number and a fraction, determine which numerators in one factor will make the product greater than the whole number.	B,C,E
2	5	*Geometry*	5.G.A.2	SR	Identify points on a coordinate plane given the coordinate pairs that represent the points.	A
3	6	*Number and Operations in Base Ten*	5.NBT.A.4	SR	Round a given decimal number in thousandths to the nearest hundredth.	D
4	6	*Number and Operations in Base Ten*	5.NBT.A.1	SR	Determine the relationship of the value of a digit in one number compared to the value of that digit in another number.	C
5	7–8	*Measurement and Data*	5.MD.C.5	CR	Determine the volumes of right rectangular prisms and find the possible dimensions of a prism with a given volume.	
6	9	*Number and Operations in Base Ten*	5.NBT.A.3	SR	Compare decimals to thousandths that are given in standard form.	A
7	9	*Number and Operations—Fractions*	5.NF.B.7	SR	Determine the real-world problem that can be represented by a given expression with a whole number divided by a fraction.	B
8	10–11	*Operations and Algebraic Thinking*	5.OA.B.3	CR	Extend two given patterns in a real-world problem and use the relationship between the two patterns to help solve the real-world problem..	
9	12	*Number and Operations in Base Ten*	5.NBT.A.2	SR	Match numbers written as powers of ten with their equivalent value written in number form.	B
10	13	*Number and Operations in Base Ten*	5.NBT.A.3	SR	Identify the equivalent word form of a number given in expanded form.	C
11	14	*Geometry*	5.G.B.4	SR	Describe the hierarchy of a given two-dimensional figure and determine which mathematical names describe a shape with a given set of attributes.	B;A,B,D
12	17	*Operations and Algebraic Thinking*	5.OA.A.1	SR	Evaluate an expression with two sets of parentheses.	A
13	17	*Number and Operations—Fractions*	5.NF.B.3	SR	Interpret a fraction as division of the numerator by the denominator.	B
14	17	*Number and Operations in Base Ten*	5.NBT.B.7	SR	Divide a decimal to hundredths by a whole number.	C
15	18	*Number and Operations—Fractions*	5.NF.B.4	SR	Use a given area model to determine the area of a rectangle with fractional side lengths.	C
16	19	*Measurement and Data*	5.MD.A.1	SA	Solve a multi-step, real-world word problem by converting ounces to pounds.	3
17	19	*Number and Operations—Fractions*	5.NF.B.6	SR	Multiply a fraction by a mixed number to solve a word problem.	B
18	20	*Measurement and Data*	5.MD.C.4	SR	Determine which figure has a volume greater than a given volume by counting unit cubes.	C
19	20	*Number and Operations in Base Ten*	5.NBT.B.6	SA	Determine the quotient of a four-digit dividend and a two-digit divisor.	215

PBT Item No.	Page No.	Reporting Category	Standard	Item Type*	Item Description	Correct Answer**
20	21	*Number and Operations—Fractions*	5.NF.A.2	SR	Determine the fraction model that shows the solution to a word problem involving the sum of two fractions with different denominators.	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 5 Mathematics
Spring 2023 Unreleased Operational Items

PBT Item No.	Reporting Category	Standard	Item Type*	Item Description
21	*Measurement and Data*	5.MD.C.4	SR	Determine the volume of a figure by counting cubes with dimensions in non-standard units.
22	*Geometry*	5.G.B.3	SR	Identify which of a set of given shapes are parallelograms.
23	*Number and Operations in Base Ten*	5.NBT.B.7	SR	Determine the product, sum, and difference of two decimals to hundredths.
24	*Number and Operations in Base Ten*	5.NBT.B.6	SA	Determine the quotient of a three-digit dividend and a two-digit divisor.
25	*Operations and Algebraic Thinking*	5.OA.A.2	SR	Select the numerical expression, with parentheses, that represents a given word expression.
26	*Number and Operations—Fractions*	5.NF.B.3	SR	Solve a word problem involving division of two whole numbers leading to a mixed number answer.
27	*Number and Operations—Fractions*	5.NF.A.1	SR	Determine the sum of two fractions with unlike denominators.
28	*Operations and Algebraic Thinking*	5.OA.A.1	SR	Determine which expression with parentheses has an equivalent value if the parentheses are removed.
29	*Number and Operations—Fractions*	5.NF.B.4	SR	Determine the real-world problem that represents the product of a unit fraction and a whole number.
30	*Measurement and Data*	5.MD.C.4	SR	Determine the volume of a right rectangular prism by counting unit cubes.
31	*Geometry*	5.G.A.1	SR	Describe the relationships between the coordinates of a given point graphed on a coordinate plane and the origin in terms of the x- and y-axes.
32	*Number and Operations in Base Ten*	5.NBT.A.3	SR	Identify the decimal numbers that can be used to complete a comparison with a given decimal number to thousandths.
33	*Number and Operations—Fractions*	5.NF.B.6	SR	Solve a real-world problem by multiplying a mixed number and a fraction.
34	*Number and Operations—Fractions*	5.NF.B.5	CR	Identify a product greater than one factor based on the size of the other factor, determine factors that will give a product that is equal to the other factor, and reason about the size of products based on the size of the factors.
35	*Number and Operations in Base Ten*	5.NBT.A.2	CR	Use the patterns in the number of zeros and the decimal point in decimal numbers to find products and quotients when multiplying and dividing by a power of 10.
36	*Number and Operations in Base Ten*	5.NBT.B.5	SR	Solve a world problem involving multiplying a three-digit whole number by a three-digit whole number.
37	*Number and Operations in Base Ten*	5.NBT.A.1	SR	Determine the relationship of the value of a digit in one number compared to that digit in another number.
38	*Measurement and Data*	5.MD.B.2	SA	Determine the line plot that represents a given list of data and use information found in a given line plot to add fractions and mixed numbers with like denominators to solve a word problem.
39	*Operations and Algebraic Thinking*	5.OA.A.2	SR	Identify a word expression that is equivalent to a given numerical expression that includes parentheses.
40	*Measurement and Data*	5.MD.C.5	SR	Determine the volume of a right rectangular prism given the base of the prism, which is packed with cubes.

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