Computer-Based Released Items
Grade 5 Mathematics
Spring 2023

The spring 2023 grade 5 Mathematics test 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.

The Department of Elementary and Secondary Education is releasing items from both versions of the test to provide information about the knowledge and skills that students are expected to demonstrate.

- Released items from the **computer-based test** are available online at mcas.pearsonsupport.com/released-items. The computer-based released items are collected in a mini test called an ePAT (electronic practice assessment tool). Items in the ePAT are displayed in TestNav 8, the testing platform for the computer-based tests.

- Released items from the **paper-based test** are available in PDF format on the Department's website at www.doe.mass.edu/mcas/testitems.html.

This document provides information about each released item from the *computer-based test*, including the following: reporting category, standard(s) covered, item type, item description, and correct answer (for released selected-response and short-answer items only). Information about unreleased operational items is also presented here. Sample student responses and scoring rubrics for released constructed-response items will be posted at www.doe.mass.edu/mcas/student/.

A Note about Testing Mode

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.

Grade 5 Mathematics
Spring 2023 Computer-Based Released Operational Items

CBT Item No.	Reporting Category	Standard	Item Type*	Item Description	Correct Answer**
1	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	Geometry	5.G.A.2	SA	Graph points on a coordinate plane given the coordinate pairs that represent the points.	*see page 5*
3	Number and Operations in Base Ten	5.NBT.A.4	SR	Round a given decimal number in thousandths to the nearest hundredth.	D
4	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	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	Number and Operations in Base Ten	5.NBT.A.3	SR	Compare decimals to thousandths that are given in standard form.	*see page 5*
7	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	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	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.	*see page 5*
10	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	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.	Part A: *see page 6* Part B: A,B,D
12	Operations and Algebraic Thinking	5.OA.A.1	SR	Evaluate an expression with two sets of parentheses.	A
13	Number and Operations-Fractions	5.NF.B.3	SA	Interpret a fraction as division of the numerator by the denominator.	*see page 6*
14	Number and Operations in Base Ten	5.NBT.B.7	SR	Divide a decimal to hundredths by a whole number.	C
15	Number and Operations-Fractions	5.NF.B.4	SA	Use a given area model to determine the area of a rectangle with fractional side lengths.	*see page 6*
16	Measurement and Data	5.MD.A.1	SA	Solve a multi-step, real-world word problem by converting ounces to pounds.	3
17	Number and Operations-Fractions	5.NF.B.6	SR	Multiply a fraction by a mixed number to solve a word problem.	B
18	Measurement and Data	5.MD.C.4	SR	Determine whether the volumes of figures are greater or less than a given volume by counting unit cubes.	*see page 6*

| 19 | 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 |
| 20 | Number and Operations-Fractions | 5.NF.A.2 | SA | Create a fraction model to show the solution to a word problem involving the sum of two fractions with different denominators. | *see page 7* |

* 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. Pages 5 through 7 of this document provide correct answers for technology-enhanced (TE) items. Sample responses and scoring guidelines for constructed-response items will be posted at www.doe.mass.edu/mcas/student/default.html.

Grade 5 Mathematics
Spring 2023 Computer-Based Unreleased Operational Items

CBT 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	SA	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	Complete a line plot using 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).

Correct Answer for CBT Item #2: Technology-Enhanced Item
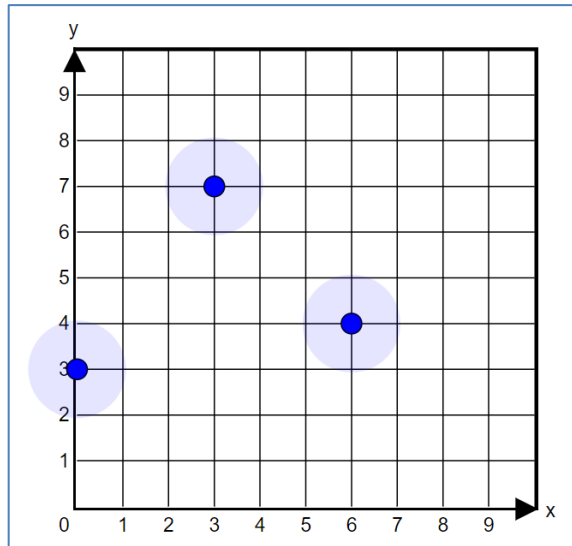
Correct Answer for CBT Item #6: Technology-Enhanced Item

2.150	=	2.15
1.071	<	1.09
5.714	<	5.8

Correct Answer for CBT Item #9: Technology-Enhanced Item

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

Correct Answer for CBT Item #11: Technology-Enhanced Item

Part A:
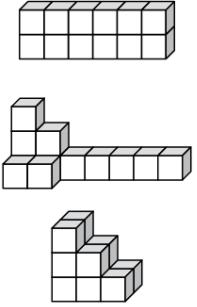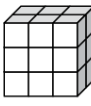
All rhombuses are [quadrilaterals, ▾] but only **some** rhombuses are [squares. ▾]

Correct Answer for CBT Item #13: Technology-Enhanced Item

[7] [÷] [8]

Correct Answer for CBT Item #15: Technology-Enhanced Item

$\frac{6}{16}$ (square foot) **or other equivalent fractions or decimals**

Correct Answer for CBT Item #18: Technology-Enhanced Item

Correct Answer for CBT Item #20: Technology-Enhanced Item

Pie

Or any equivalent fraction model