

Computer-Based Released Items
Grade 5 Mathematics
Spring 2018

The spring 2018 grade 5 Mathematics test was administered in two formats: a computer-based version and a paper-based version.

- Released items from the **computer-based version** of the test are available online at ricas.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 version** of the 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: reporting category, standard covered, item type, item description, and correct answer (for certain selected-response and short-answer items only). Information about unreleased operational items is also presented here, along with scoring rubrics for constructed-response questions.

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 some instances, the wording of a paper item differed slightly from the computer-based version. In places where a technology-enhanced item was used on the computer-based test, that item was typically replaced with one or more alternative items on the paper test. These alternative items sometimes assessed the same standard as the technology-enhanced item, or other standards from the same reporting category.

Grade 5 Mathematics
Spring 2018 Computer-Based Released Operational Items:
Reporting Categories, Standards, Item Descriptions, and Correct Answers

CBT Item No.*	ePAT Item No.*	Reporting Category	Standard	Item Type**	Description	Correct Answer***
1	1	<i>Operations & Algebraic Thinking</i>	5.OA.A.01	SR	Evaluate a numerical expression that contains parentheses.	A
4	2	<i>Number & Operations in Base Ten</i>	5.NBT.A.03	SA	Determine the expanded form of a number expressed in verbal form.	<i>see page 5</i>
5	3	<i>Number & Operations in Base Ten</i>	5.NBT.A.02	SR	Write a given expression as a power of 10.	D
6	4	<i>Number & Operations in Base Ten</i>	5.NBT.B.06	SA	Determine the quotient of a four-digit dividend and a two-digit divisor.	235
7	5	<i>Measurement & Data</i>	5.MD.A.01	CR	Convert distances in the metric system and solve multi-step, real-world problems using the conversions.	
9	6	<i>Measurement & Data</i>	5.MD.C.05	SA	Determine the total volume of two non-overlapping right rectangular prisms.	48
11	7	<i>Number & Operations—Fractions</i>	5.NF.B.07	SR	Interpret the quotient of a fraction divided by a whole number.	A
13	8	<i>Number & Operations in Base Ten</i>	5.NBT.A.04	SR	Estimate a sum by rounding.	B
14	9	<i>Measurement & Data</i>	5.MD.B.02	SA	Complete a line plot with whole number and mixed number labels.	<i>see page 5</i>
18	10	<i>Number & Operations in Base Ten</i>	5.NBT.B.07	SR	Determine the numerical expression that can be used to solve a decimal multiplication problem.	D
19	11	<i>Number & Operations—Fractions</i>	5.NF.B.05	SR	Explain why multiplying a whole number by a fraction less than, greater than, or equal to one gives a product that is less than, greater than, or equal to that whole number.	<i>see page 6</i>
20	12	<i>Number & Operations in Base Ten</i>	5.NBT.B.05	SR	Determine the product of a two-digit whole number multiplied by a three-digit whole number.	B
22	13	<i>Geometry</i>	5.G.A.02	SA	Select the place on a coordinate plane that represents a given ordered pair.	<i>see page 6</i>
25	14	<i>Number & Operations—Fractions</i>	5.NF.B.04	CR	Find the product of a mixed number and a fraction, write an equation, and find area using mixed numbers and fractions.	
26	15	<i>Operations & Algebraic Thinking</i>	5.OA.A.01	SA	Evaluate an expression involving parentheses.	15
27	16	<i>Number & Operations in Base Ten</i>	5.NBT.B.07	SR	Solve a word problem by adding and subtracting decimals to hundredths.	A
31	17	<i>Operations & Algebraic Thinking</i>	5.OA.A.02	SR	Identify a verbal statement that is equivalent to a given number expression with parentheses.	D
33	18	<i>Geometry</i>	5.G.B.04	SR	Identify the true statement about properties of a triangle.	C

36	19	<i>Measurement & Data</i>	5.MD.C.03	SR	Given the height and the area of the base, determine the volume of a right rectangular prism to solve a word problem.	C
39	20	<i>Operations & Algebraic Thinking</i>	5.OA.B.03	SR	Given points plotted on a coordinate plane that were created from corresponding terms of two patterns, identify a relationship between the corresponding terms.	B
40	21	<i>Number & Operations—Fractions</i>	5.NF.A.02	SR	Solve a word problem by finding the sum of two fractions with unlike denominators.	D

**“CBT Item Number” refers to the position of the item on the operational computer-based test. This is the item number that DESE refers to when reporting student results for a CBT item. “ePAT Item Number” refers to the position of the item in the 2018 released item set for grade 5 Mathematics, found online at mcas.pearsonsupport.com/released-items.

**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. Correct answers for technology-enhanced (TE) items can be found on page 5 of this document. 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 2018 Computer-Based Unreleased Operational Items:
Reporting Categories, Standards, and Item Descriptions

CBT Item No.*	Reporting Category	Standard	Item Type**	Description
2	<i>Number & Operations—Fractions</i>	5.NF.A.01	SR	Determine the sum of a fraction and a mixed number with unlike denominators.
3	<i>Measurement & Data</i>	5.MD.C.05	SR	Find the volume of a right rectangular prism given the length, width, and height.
8	<i>Number & Operations—Fractions</i>	5.NF.A.02	SR	Estimate the sum of two fractions less than one to solve a word problem.
10	<i>Geometry</i>	5.G.A.01	SR	Identify the ordered pairs of points plotted on a coordinate plane.
12	<i>Operations & Algebraic Thinking</i>	5.OA.B.03	CR	Extend two different patterns and explain the relationship between corresponding terms in the patterns.
15	<i>Geometry</i>	5.G.B.03	SR	Determine attributes of an equilateral triangle.
16	<i>Measurement & Data</i>	5.MD.C.04	SR	Select the right rectangular prisms packed with unit cubes that are equal to a given volume.
17	<i>Geometry</i>	5.G.A.02	SR	Use a coordinate plane to interpret coordinate values of points in the context of a real-world problem.
21	<i>Number & Operations—Fractions</i>	5.NF.B.03	SR	Interpret a fraction as division of the numerator by the denominator.
23	<i>Measurement & Data</i>	5.MD.A.01	SA	Convert from yards to feet.
24	<i>Number & Operations in Base Ten</i>	5.NBT.A.04	SR	Round a decimal number to the nearest whole number.
28	<i>Measurement & Data</i>	5.MD.C.04	SR	Solve a word problem involving finding the volume of a right rectangular prism by counting unit cubes.
29	<i>Number & Operations in Base Ten</i>	5.NBT.A.02	CR	Write numbers given in exponential form as numbers in standard form and find an unknown exponent in a product.
30	<i>Number & Operations—Fractions</i>	5.NF.B.06	SA	Find the area of a rectangle with fractional dimensions.
32	<i>Number & Operations—Fractions</i>	5.NF.B.06	SR	Multiply a fraction by a mixed number to solve a word problem.
34	<i>Number & Operations in Base Ten</i>	5.NBT.A.01	SR	Compare the values of digits in four-digit whole numbers.
35	<i>Number & Operations in Base Ten</i>	5.NBT.B.05	SR	Multiply multi-digit whole numbers to solve word problems.
37	<i>Number & Operations—Fractions</i>	5.NF.B.03	SR	Solve a word problem involving division of two whole numbers leading to a mixed number answer.
38	<i>Number & Operations in Base Ten</i>	5.NBT.A.03	SR	Write a decimal number to hundredths in both written and expanded forms.

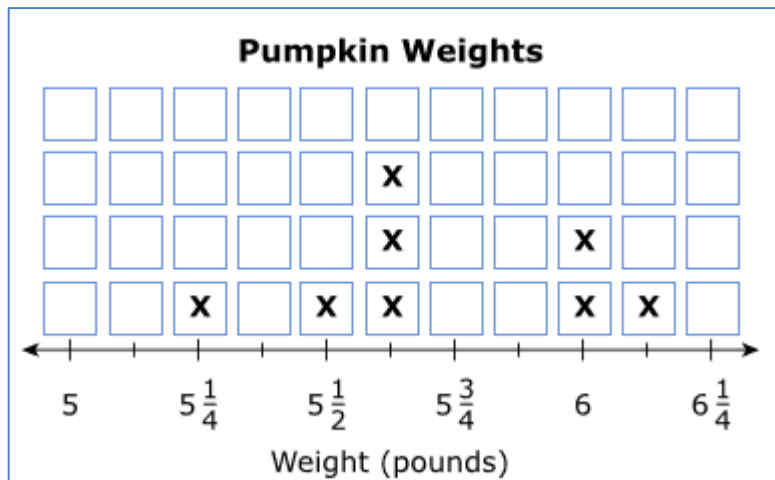
*“CBT Item Number” refers to the position of the item on the operational computer-based test. This is the item number that DESE refers to when reporting student results for a CBT item.

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

Correct Answer for CBT Item #4: Technology-Enhanced Item

$$\boxed{4} \times 100 + \boxed{1} \times 10 + \boxed{6} \times 1 + \boxed{8} \times \frac{1}{10} + \boxed{2} \times \frac{1}{100}$$

Correct Answer for CBT Item #14: Technology-Enhanced Item



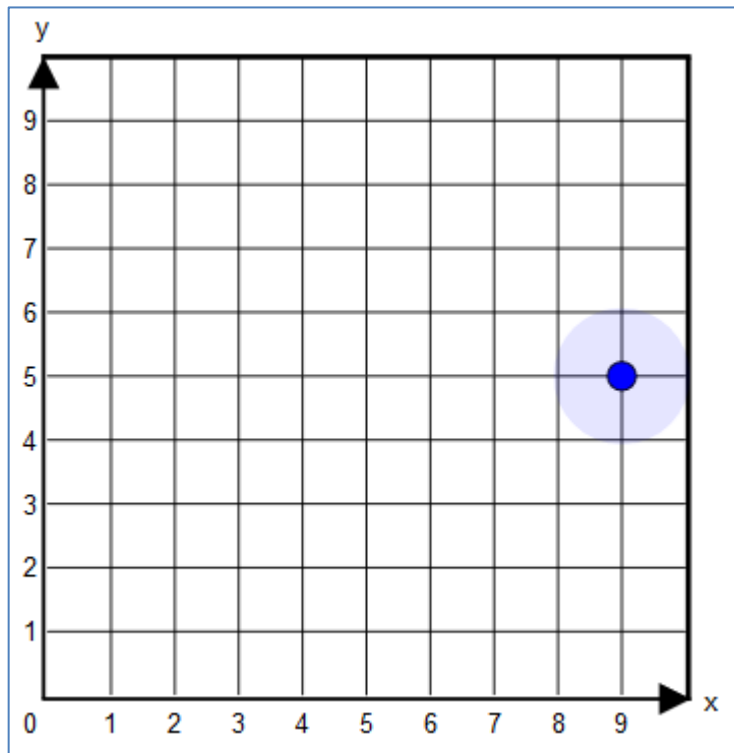
Correct Answer for CBT Item #19: Technology-Enhanced Item

The product of $6 \times \frac{5}{3}$ will be **6** because the fraction $\frac{5}{3}$ is **1**.

The product of $7 \times \frac{6}{6}$ will be **7** because the fraction $\frac{6}{6}$ is **1**.

The product of $3 \times \frac{2}{3}$ will be **3** because the fraction $\frac{2}{3}$ is **1**.

Correct Answer for CBT Item #22: Technology-Enhanced Item



Rubric for CBT Item #7: Constructed Response

Scoring Guide	
Score	Description
4	The student response demonstrates an exemplary understanding of the Measurement and Data concepts involved in converting among different-sized standard measurement units within a given system of measurement and using these conversions in solving multi-step, real-world problems. The student correctly converts distances in the metric system and solves multi-step, real-world problems using the conversions.
3	The student response demonstrates a good understanding of the Measurement and Data concepts involved in converting among different-sized standard measurement units within a given system of measurement and using these conversions in solving multi-step, real-world problems. Although there is significant evidence that the student was able to recognize and apply the concepts involved, some aspect of the response is flawed. As a result, the response merits 3 points.
2	The student response demonstrates a fair understanding of the Measurement and Data concepts involved in converting among different-sized standard measurement units within a given system of measurement and using these conversions in solving multi-step, real-world problems. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points.
1	The student response demonstrates a minimal understanding of the Measurement and Data concepts involved in converting among different-sized standard measurement units within a given system of measurement and using these conversions in solving multi-step, real-world problems.
0	The student response contains insufficient evidence of an understanding of the Measurement and Data concepts involved in converting among different-sized standard measurement units within a given system of measurement and using these conversions in solving multi-step, real-world problems to merit any points.

Rubric for CBT Item #25: Constructed Response

Scoring Guide	
Score	Description
4	The student response demonstrates an exemplary understanding of the Numbers and Operations—Fractions concepts involved in applying and extending previous understandings of multiplication to multiply a fraction or whole number by a fraction. The student correctly finds the product of a mixed number and a fraction, writes an equation, and finds area using mixed numbers and fractions.
3	The student response demonstrates a good understanding of the Numbers and Operations—Fractions concepts involved in applying and extending previous understandings of multiplication to multiply a fraction or whole number by a fraction. Although there is significant evidence that the student was able to recognize and apply the concepts involved, some aspect of the response is flawed. As a result, the response merits 3 points.
2	The student response demonstrates a fair understanding of the Numbers and Operations—Fractions concepts involved in applying and extending previous understandings of multiplication to multiply a fraction or whole number by a fraction. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points.
1	The student response demonstrates a minimal understanding of the Numbers and Operations—Fractions concepts involved in applying and extending previous understandings of multiplication to multiply a fraction or whole number by a fraction.
0	The student response contains insufficient evidence of an understanding of the Numbers and Operations—Fractions concepts involved in applying and extending previous understandings of multiplication to multiply a fraction or whole number by a fraction to merit any points.