Computer-Based Released Items
Grade 4 Mathematics
Spring 2018

The spring 2018 grade 4 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 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 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 4 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 4 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	*Geometry*	4.G.A.01	SR	Determine the number of right angles in a given polygon.	B
4	2	*Number & Operations—Fractions*	4.NF.A.01	SA	Shade in a fraction model to represent an equivalent fraction to a given fraction.	*see page 5*
5	3	*Number & Operations—Fractions*	4.NF.C.05	SR	Add two fractions with denominators 10 and 100 by writing equivalent fractions with like denominators.	C
7	4	*Number & Operations in Base Ten*	4.NBT.A.02	CR	Write numbers in expanded notation and standard form, determine a number that meets given criteria, and write a number sentence using <, >, or = to compare numbers.	
14	5	*Number & Operations—Fractions*	4.NF.C.07	SR	Compare decimals to hundredths using <, >, or =.	*see page 5*
16	6	*Number & Operations in Base Ten*	4.NBT.B.06	SR	Give the value of a variable that makes a division equation true.	C
20	7	*Number & Operations—Fractions*	4.NF.B.04	SR	Determine which expression is equivalent to a given fraction.	D
21	8	*Number & Operations—Fractions*	4.NF.C.07	SR	Use a visual model to identify a decimal that is equivalent to a given decimal.	C
22	9	*Operations & Algebraic Thinking*	4.OA.B.04	SR	Determine which numbers are multiples of given values.	*see page 6*
26	10	*Measurement & Data*	4.MD.A.01	SA	Express an amount given in liters in milliliters.	3000
28	11	*Measurement & Data*	4.MD.C.07	SR	Determine an angle measure given the measures of two adjacent angles and the sum of all three angle measures.	B
29	12	*Operations & Algebraic Thinking*	4.OA.C.05	CR	Determine additional terms of a pattern given the rule, explain how the rule effects the pattern, and then analyze a similar pattern to find additional terms.	
30	13	*Number & Operations—Fractions*	4.NF.B.04	SR	Determine the product of a whole number and a unit fraction.	A
31	14	*Measurement & Data*	4.MD.B.04	SR	Find the difference between two values from a line plot with fraction, mixed number, and whole number values.	C
32	15	*Number & Operations—Fractions*	4.NF.B.03	SA	Write an addition expression that is equivalent to a given fraction.	*see page 6*
33	16	*Geometry*	4.G.A.03	SR	Determine which figure has exactly one line of symmetry.	B
34	17	*Number & Operations—Fractions*	4.NF.C.06	SR	Determine which decimal is equivalent to a given fraction with a denominator of 100.	B

37	18	*Number & Operations in Base Ten*	4.NBT.A.01	SA	Determine how many times the value of a digit in one number is compared to the value of the digit in another number.	10
38	19	*Measurement & Data*	4.MD.C.05	SA	Determine the measure of an angle that turns through a given fraction of a circle.	90
39	20	*Geometry*	4.G.A.02	SR	Identify the shape that matches a given list of features describing the sides and angles of the shape.	D
40	21	*Operations & Algebraic Thinking*	4.OA.A.02	SR	Choose a multiplication equation that can be used to solve a word problem with a multiplicative comparison.	C

*"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 4 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 pages 5–6 of this document. Sample responses and scoring guidelines for any constructed-response items will be posted to the Department's website later this year.

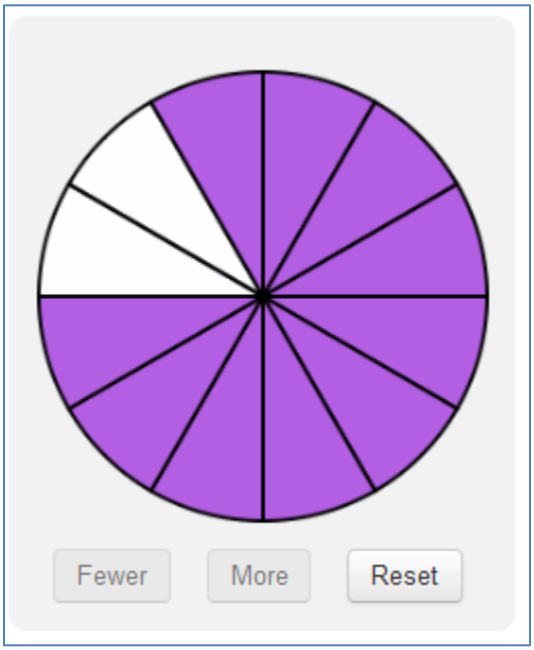
Grade 4 Mathematics
Spring 2018 Computer-Based Unreleased Operational Items: Reporting Categories, Standards, and Item Descriptions

CBT Item No.*	Reporting Category	Standard	Item Type**	Description
2	*Number & Operations in Base Ten*	4.NBT.B.04	SA	Given one three- digit addend and the four-digit sum, determine the missing addend.
3	*Number & Operations in Base Ten*	4.NBT.B.06	SR	Write related multiplication equations for given division equations that include a variable.
6	*Measurement & Data*	4.MD.A.02	SR	Solve a word problem involving amounts of money written in dollars and cents.
8	*Number & Operations—Fractions*	4.NF.C.06	SR	Identify the value that describes the location of a point on a number line and write that value as a fraction and as a decimal.
9	*Number & Operations in Base Ten*	4.NBT.B.05	SA	Multiply a four-digit whole number and a one-digit whole number.
10	*Measurement & Data*	4.MD.C.06	SR	Identify three angles, displayed with protractors, that have a measure greater than a given angle measure.
11	*Measurement & Data*	4.MD.A.02	SR	Given a starting time on an analog clock and the amount of time a task will take, determine what the time will be when the task is finished.
12	*Number & Operations—Fractions*	4.NF.B.03	CR	Solve word problems by adding fractions with like denominators and comparing fractions with like numerators.
13	*Operations & Algebraic Thinking*	4.OA.B.04	SR	Solve a word problem by identifying a multiple of a given whole number.
15	*Geometry*	4.G.A.03	SR	Identify a shape that has more than one line of symmetry.
17	*Operations & Algebraic Thinking*	4.OA.A.03	SA	Solve multi-step word problems by adding 3 four-digit whole numbers and by adding and subtracting four-digit whole numbers.
18	*Number & Operations—Fractions*	4.NF.A.02	SR	Complete fraction comparisons with the symbols <, >, or =.
19	*Number & Operations in Base Ten*	4.NBT.B.04	SA	Subtract a four-digit whole number from another four-digit whole number.
23	*Operations & Algebraic Thinking*	4.OA.A.02	SR	Divide to solve a word problem involving a multiplicative comparison.
24	*Geometry*	4.G.A.02	SR	Identify which shapes have parallel sides, perpendicular sides, or both.
25	*Measurement & Data*	4.MD.A.03	CR	Use a ruler to measure the sides of a rectangle and then find the area of the rectangle.
27	*Number & Operations—Fractions*	4.NF.C.05	SA	Determine the missing addend in an equation containing fractions with denominators of 10 and 100.
35	*Number & Operations—Fractions*	4.NF.A.02	SR	Compare fractions with different denominators to determine which fraction is the greatest and then identify fractions that are equivalent to a given fraction.
36	*Operations & Algebraic Thinking*	4.OA.A.01	SR	Write a multiplication equation to represent a multiplicative comparison written in words.

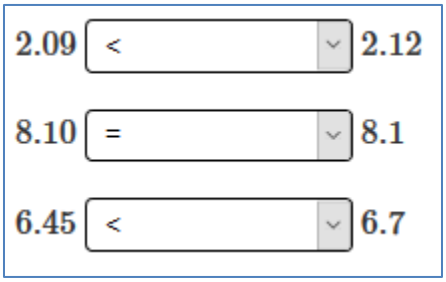
*"CBT Item Number" refers to the position of the item on the operational computer-based test. This is the item number that DESE refers to when reporting student results for a CBT item.

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

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



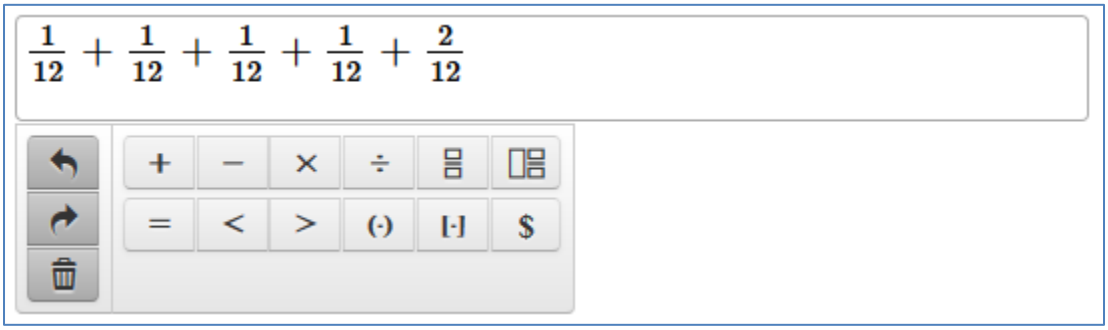
Correct Answer for CBT Item #14: Technology-Enhanced Item



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

Number	Multiple of 4	Multiple of 7
16	☑	☐
28	☑	☑
42	☐	☑

Correct Answer for CBT Item #32: Technology-Enhanced Item



Rubric for CBT Item #7: Constructed Response

Scoring Guide	
Score	Description
4	The student response demonstrates an exemplary understanding of the Number and Operations in Base Ten concepts involved in reading and writing multi-digit whole numbers using base-ten numerals, number names, and expanded form, and using the appropriate symbols to compare multi-digit numbers. The student correctly writes numbers in expanded notation and standard form, determines a number that meets given criteria, and writes a number sentence using <, >, or = to compare numbers.
3	The student response demonstrates a good understanding of the Number and Operations in Base Ten concepts involved in reading and writing multi-digit whole numbers using base-ten numerals, number names, and expanded form, and using the appropriate symbols to compare multi-digit numbers. 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 Number and Operations in Base Ten concepts involved in reading and writing multi-digit whole numbers using base-ten numerals, number names, and expanded form, and using the appropriate symbols to compare multi-digit numbers. 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 Number and Operations in Base Ten concepts involved in reading and writing multi-digit whole numbers using base-ten numerals, number names, and expanded form, and using the appropriate symbols to compare multi-digit numbers.
0	The student response contains insufficient evidence of an understanding of the Number and Operations in Base Ten concepts involved in reading and writing multi-digit whole numbers using base-ten numerals, number names, and expanded form, and using the appropriate symbols to compare multi-digit numbers to merit any points.

Rubric for CBT Item #29: Constructed Response

Scoring Guide	
Score	Description
4	The student response demonstrates an exemplary understanding of the Operations and Algebra concepts involved in generating a number or shape pattern that follows a given rule, and identifying apparent features of the pattern that were not explicit in the rule itself. The student correctly determines additional terms of a pattern given the rule, explains how the rule effects the pattern, and then analyzes a similar pattern to add terms.
3	The student response demonstrates a good understanding of the Operations and Algebra concepts involved in generating a number or shape pattern that follows a given rule, and identifying apparent features of the pattern that were not explicit in the rule itself. 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 Operations and Algebra concepts involved in generating a number or shape pattern that follows a given rule, and identifying apparent features of the pattern that were not explicit in the rule itself. 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 Operations and Algebra concepts involved in generating a number or shape pattern that follows a given rule, and identifying apparent features of the pattern that were not explicit in the rule itself.
0	The student response contains insufficient evidence of the Operations and Algebra concepts involved in generating a number or shape pattern that follows a given rule, and identifying apparent features of the pattern that were not explicit in the rule itself to merit any points.