Computer-Based Released Items
Grade 5 MCAS Science and Technology/Engineering
Spring 2019

The spring 2019 grade 5 Science and Technology/Engineering (STE) test was administered in two primary formats: a computer-based version and a paper-based version. The vast majority of students took the computer-based test. The paper-based test was offered as an accommodation for students with disabilities who are unable to use a computer, as well as for English learners who are new to the country and are unfamiliar with technology.

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: reporting category, standard(s) covered, item type, item description, and correct answer (for selected-response items only). Information about unreleased operational items is also presented here, and scoring rubrics are provided for released constructed-response items.

A Note about Testing Mode

Most of the operational items on the grade 5 STE 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 or multiple-select items that tested the same STE content and assessed the same standard as the technology-enhanced item.

Grade 5 Science and Technology/Engineering
Spring 2019 Computer-Based Released Operational Items

CBT Item No.	Reporting Category	Standard	Practice Category	Item Type*	Item Description	Correct Answer (SR)**
1	Physical Sciences	5.PS.1.3	B. Mathematics and Data	SR	Analyze data from an investigation to determine which substances were mixed together.	B
2	Earth and Space Science	5.ESS.3.2	A. Investigations and Questioning	SR	Describe what observation students should make to determine how well a simple water filter works.	A
3	Life Science	5.LS.1.1	None	SR	Describe how plants use energy from the Sun to convert air and water into sugar.	*see page 6*
4	Technology /Engineering	3.ETS.1.2	C. Evidence, Reasoning, and Modeling	SR	Determine how a composter could be improved to break down waste more efficiently.	A
5	Life Science	5.LS.2.1	None	SR	Identify bacteria as decomposers and identify the role of decomposers.	*see page 6*
6	Technology/ Engineering	3.ETS.1.4	None	CR	Describe advantages of different representations of a design solution and, given a design solution, describe one disadvantage of it.	*see page 8*
7	Earth and Space Science	5.ESS.3.1	None	SR	Determine a way to reduce the amount of water used from a town's water supply.	D
8	Life Science	3.LS.4.1	C. Evidence, Reasoning, and Modeling	SR	Compare fossils in rock layers to determine which fossils are oldest and determine why scientists study fossils.	*see page 6* Part B: C
9	Technology/ Engineering	4.ETS.1.3	A. Investigations and Questioning	SR	Determine what should be measured to test how well a design solution meets a criterion of the design problem.	D
10	Physical Sciences	3.PS.2.3	A. Investigations and Questioning	SR	Determine the question that students were trying to answer during an investigation with magnets.	B
11	Earth and Space Science	3.ESS.2.2	B. Mathematics and Data	SR	Compare climate data from different regions and determine which region is a tropical rainforest.	D
12	Life Science	3.LS.4.2	B. Mathematics and Data	SR	Complete a model that shows how variations in characteristics among individuals in the same population may provide a survival advantage in a given environment.	*see page 6*

13	Physical Sciences	4.PS.4.2	C. Evidence, Reasoning, and Modeling	SR	Select a model that shows how a person sees an object.	C
14	Life Science	3.LS.3.1	C. Evidence, Reasoning, and Modeling	SR	Describe how plants have traits that are inherited, with variations in these traits existing within the population.	A
15	Physical Sciences	5.PS.2.1	C. Evidence, Reasoning, and Modeling	SR	Determine the direction of the gravitational force exerted on objects located at different locations on Earth.	*see page 7*
16	Earth and Space Science	5.ESS.1.2	None	SR	Describe Earth's movement relative to the Sun at different times of year.	C
17	Physical Sciences	4.PS.3.2	C. Evidence, Reasoning, and Modeling	CR	Describe how different types of energy are converted into other types of energy in a given setup.	*see page 8*
18	Earth and Space Science	5.ESS.2.2	None	CR	Distinguish between freshwater and saltwater sources and compare the relative amount of each.	*see page 8*
19	Life Science	3.LS.4.4	C. Evidence, Reasoning, and Modeling	SR	Identify how a change in a habitat may affect the ability of an organism to survive and reproduce.	D
20	Technology/ Engineering	5.ETS.3.2	C. Evidence, Reasoning, and Modeling	SR	Interpret a diagram to determine the function of part of a device.	D

* STE item types are selected-response (SR) and constructed-response (CR).

**Answers are provided here for selected-response items only. Scoring rubrics for constructed-response items are also provided in this document. Sample responses and scoring guidelines for constructed-response items will be posted to the Department's website later this year.

Grade 5 Science and Technology/Engineering
Spring 2019 Computer-Based Unreleased Operational Items

CBT Item No.	Reporting Category	Standard	Practice Category	Item Type*	Item Description
21	Technology/ Engineering	3.ETS.1.4	None	SR	Identify the most helpful representation for a design solution.
22	Physical Sciences	5.PS.1.2	B. Mathematics and Data	SR	Complete a model to show the mass of a substance after a phase change.
23	Technology/ Engineering	5.ETS.3.1	None	SR	Distinguish between an innovation and an invention given descriptions of two technologies.
24	Life Science	5.LS.2.1	C. Evidence, Reasoning, and Modeling	CR	Analyze a food web to describe how matter moves through the food web and how changes to one population would affect another.
25	Life Science	4.LS.1.1	C. Evidence, Reasoning, and Modeling	CR	Identify a trait that helps provide camouflage to an organism and describe how another trait helps the organism survive in its environment.
26	Earth and Space Science	4.ESS.3.1	None	SR	Describe how humans use energy and fuels and distinguish between renewable and nonrenewable energy sources.
27	Technology/ Engineering	4.ETS.1.5	None	SR	Analyze a design and identify the property that is most important to consider for the design.
28	Physical Sciences	4.PS.3.3	B. Mathematics and Data	SR	Analyze data to determine which conditions will produce a louder sound during a collision.
29	Physical Sciences	5.PS.1.1	None	SR	Identify the cause of ice melting at room temperature.
30	Physical Sciences	4.PS.3.4	A. Investigations and Questioning	SR	Identify how a device can be changed to test how stored energy affects the motion of the device.
31	Earth and Space Science	4.ESS.1.1	None	SR	Describe how features of a given landscape provide evidence about the role of deposition in the landscape's formation.
32	Earth and Space Science	5.ESS.2.1	C. Evidence, Reasoning, and Modeling	SR	Complete a model of the water cycle by labeling different parts of the model.
33	Earth and Space Science	4.ESS.2.1	None	SR	Identify evidence of rocks being broken into smaller pieces through weathering.
34	Earth and Space Science	3.ESS.2.1	B. Mathematics and Data	CR	Make claims about seasonal weather in an area and support the claims with evidence from given data tables.
35	Technology/ Engineering	3.ESS.3.1	A. Investigations and Questioning	SR	Determine what should be considered when designing a solution to reduce damage caused by flooding.
36	Technology/ Engineering	4.ESS.3.2	None	SR	Determine which design solution will work best for a given situation.

37	Physical Sciences	3.PS.2.1	C. Evidence, Reasoning, and Modeling	SR	Determine which diagrams show balanced and unbalanced forces acting on an object and identify what occurs when forces acting on an object are balanced.
38	Life Science	3.LS.1.1	None	SR	Determine when a plant and an animal are going through the same life cycle stage.
39	Physical Sciences	4.PS.4.1	C. Evidence, Reasoning, and Modeling	SR	Determine the type of energy transferred by water waves.
40	Technology/ Engineering	3.ETS.1.1	A. Investigations and Questioning	SR	Determine the problem a given structure was designed to solve.
41	Life Science	5.PS.3.1	A. Investigations and Questioning	SR	Determine which activity a scientist should study to learn how animals get energy for life processes.

* STE item types are selected-response (SR) and constructed-response (CR).

Correct Answer for CBT Item #3: Technology-Enhanced Item

In photosynthesis, vegetable plants use the energy from sunlight to convert air and water into sugar.

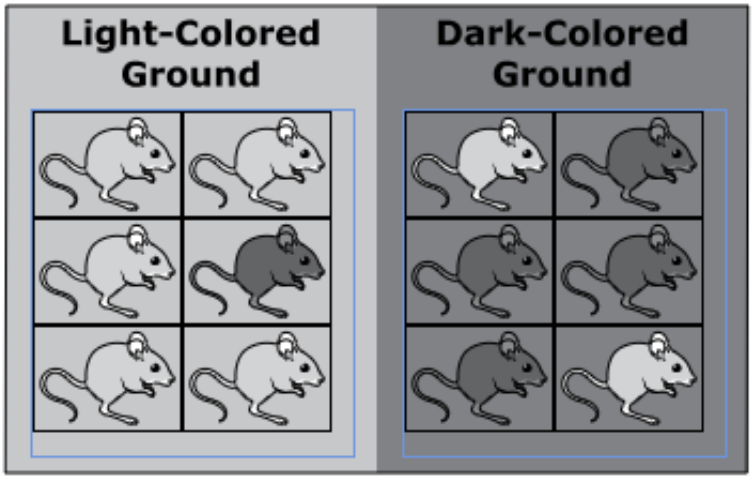
Correct Answer for CBT Item #5: Technology-Enhanced Item

Bacteria in a composter are decomposers because they recycle materials.

Correct Answer for CBT Part A of Item #8: Technology-Enhanced Item

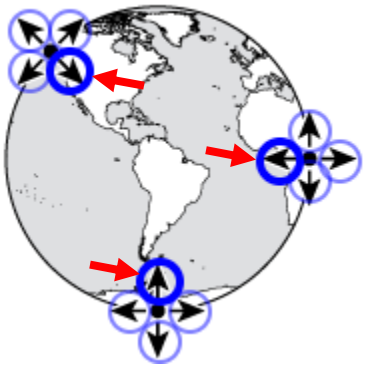
The fossils in rock layer Y are the oldest because they are in the bottom layer.

Correct Answer for CBT Item #12: Technology-Enhanced Item



Scoring note: Student responses should show <u>at least four</u> mice in each colored grid whose fur color matches the color of the ground (e.g., light-colored fur on light-colored ground) to receive credit for this item.

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



Correct Answer for CBT Part A of Item #18: Technology-Enhanced Item

Freshwater Source	Saltwater Source
Lake Istokpoga	Atlantic Ocean
Lake Okeechobee	Gulf of Mexico
Caloosahatchee River	
Peace River	
Kissimmee River	

Scoring Rubric for CBT Item #6: Constructed Response

Scoring Guide	
Score	**Description**
3	The response demonstrates a thorough understanding of presenting different representations of a design solution. The response clearly describes one advantage of making a prototype instead of a diagram and one advantage of making a diagram instead of a prototype. The response also clearly describes one disadvantage of using cardboard instead of wood in a composter.
2	The response demonstrates a partial understanding of presenting different representations of a design solution.
1	The response demonstrates a minimal understanding of presenting different representations of a design solution.
0	The response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

Scoring Rubric for CBT Item #17: Constructed Response

Scoring Guide	
Score	**Description**
3	The response demonstrates a thorough understanding of the transfer of different types of energy from place to place. The response clearly describes one part of the setup in which a type of energy is converted to another type of energy. The response correctly identifies one other type of energy that is observed in this setup, and clearly describes how the students could observe this type of energy.
2	The response demonstrates a partial understanding of the transfer of different types of energy from place to place.
1	The response demonstrates a minimal understanding of the transfer of different types of energy from place to place.
0	The response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

Scoring Rubric for CBT Part B of Item #18: Constructed Response

Scoring Guide	
Score	**Description**
2	The response demonstrates a thorough understanding of the relative amounts salt water in the ocean and fresh water in lakes and rivers. The response correctly sorts the sources of freshwater and salt water and clearly describes how the amount of fresh water compares to the amount of salt water shown on the map.
1	The response demonstrates a partial understanding of the relative amounts salt water in the ocean and fresh water in lakes and rivers.
0	The response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.