

Computer-Based Released Items High School Biology MCAS Spring 2026

The spring 2026 High School Biology 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. More information can be found on the MCAS Test Administration Resources page at www.doe.mass.edu/mcas/admin.html.

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.onlinehelp.cognia.org/released-items.
- Released items from the paper-based test are available in PDF format on the Department's website at www.doe.mass.edu/mcas/release.html.

This document provides information about each released item from the computer-based test, including the following: reporting category, standard covered, science practice category, item type, item description, and correct answer (for selected-response items only). Sample responses and scoring guidelines for constructed-response items will be posted at www.doe.mass.edu/mcas/student/default.html.

A Note about Testing Mode

Most of the operational items on the Biology 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 science content and assessed the same standard as the technology-enhanced item.

High School Biology
Spring 2026 Computer-Based Released Operational Items

CBT Item No.*	Reporting Category	Standard	Science and Engineering Practice Categories	Item Type**	Item Description	Correct Answer***
1	<i>Heredity</i>	HS.LS.3.4	A. Investigations and Questioning	SR	Analyze data to determine whether characteristics of a plant are more likely the result of genetic or environmental factors.	<i>see page 7</i>
2	<i>Heredity</i>	HS.LS.3.1	C. Evidence, Reasoning, and Modeling	SR	Identify the final products after a cell completes meiosis.	D
3	<i>Molecules to Organisms</i>	HS.LS.1.7	A. Investigations and Questioning	SR	Analyze an investigation to identify changes that should be made to better determine the rate of cellular respiration in yeast cells.	C,E
4	<i>Molecules to Organisms</i>	HS.LS.1.3	None	SR	Describe how homeostasis is restored in a feedback loop.	B
5	<i>Molecules to Organisms</i>	HS.LS.1.6	B. Mathematics and Data	SR	Analyze a graph to determine how nitrogen availability affects the growth of certain trees and determine that this affects the tree's ability to produce structural proteins.	<i>see page 7</i>
6	<i>Ecology</i>	HS.LS.2.4	C. Evidence, Reasoning, and Modeling	SR	Identify the ecological role of an organism based on a food web.	A
7	<i>Ecology</i>	HS.LS.2.5	None	SR	Identify a carbon cycle process that moves carbon in an ecosystem.	B
8	<i>Heredity</i>	HS.LS.3.1	C. Evidence, Reasoning, and Modeling	SR	Complete a model of sexual reproduction.	<i>see page 7</i>
9	<i>Heredity</i>	HS.LS.3.3	B. Mathematics and Data	SR	Determine the probability of offspring with a certain phenotype from a given genetic cross.	A
10	<i>Molecules to Organisms</i>	HS.LS.1.2	C. Evidence, Reasoning, and Modeling	SR	Complete a model of gas exchange in a human lung.	<i>see page 7</i>
11	<i>Heredity</i>	HS.LS.3.1	None	SR	Identify the process that produces gametes.	D

12	<i>Ecology</i>	HS.LS.2.2	C. Evidence, Reasoning, and Modeling	SR	Explain the most likely effect on genetic diversity when individuals from one population are introduced into a different population.	D
13	<i>Heredity</i>	HS.LS.3.3	C. Evidence, Reasoning, and Modeling	SR	Determine the most likely inheritance pattern for a trait based on given information.	see page 8
14	<i>Ecology</i>	HS.LS.2.1	C. Evidence, Reasoning, and Modeling	SR	Explain how habitat destruction affects the survival of a population and determine how changes in food availability impact the carrying capacity for the population.	Part A: D Part B: see page 8
15	<i>Evolution</i>	HS.LS.4.2	C. Evidence, Reasoning, and Modeling	CR	Identify how an adaptation can become part of the gene pool and explain how that adaptation can become more common in the population over time.	
16	<i>Ecology</i>	HS.LS.2.4	B. Mathematics and Data	SR	Calculate the maximum amount of energy at a certain trophic level based on the amount of energy in the trophic level of plants in a food web.	C
17	<i>Molecules to Organisms</i>	HS.LS.1.5	B. Mathematics and Data	SR	Interpret a graph to determine how the color of light affects photosynthesis and oxygen production.	see page 8
18	<i>Heredity</i>	HS.LS.3.2	C. Evidence, Reasoning, and Modeling	SR	Identify two descriptions of crossing over based on a diagram.	B,D
19	<i>Molecules to Organisms</i>	HS.LS.1.1	C. Evidence, Reasoning, and Modeling	CR	Analyze DNA sequences to explain why a cell has a mutation, determine mRNA and amino acid sequences based on DNA sequences, and explain why the mutation is not likely to cause a phenotypic change.	

20	<i>Ecology</i>	HS.LS.2.7	C. Evidence, Reasoning, and Modeling	CR	Analyze a food web to explain how populations would change under different environmental conditions and when another population in the food web decreases, and explain why a population increased with increased rainfall.	
21	<i>Molecules to Organisms</i>	HS.LS.1.7	C. Evidence, Reasoning, and Modeling	SR	Complete a model of cellular respiration and describe how the missing product is used in cells.	see page 8
22	<i>Heredity</i>	HS.LS.3.2	None	SR	Identify an error in a description of meiosis.	see page 8
23	<i>Evolution</i>	HS.LS.4.5	C. Evidence, Reasoning, and Modeling	SR	Explain how geographic isolation of populations led to the formation of different species.	C
24	<i>Molecules to Organisms</i>	HS.LS.1.4	C. Evidence, Reasoning, and Modeling	SR	Use a model to determine the process that ensures replicated DNA is identical to the original DNA, and explain why DNA replication must occur before mitosis.	D;C
25	<i>Heredity</i>	HS.LS.3.1	None	SR	Explain why an organism has some genetic traits that are different from one of its parents.	C
26	<i>Heredity</i>	HS.LS.3.4	C. Evidence, Reasoning, and Modeling	SR	Analyze phenotype and genotype data to determine which plant was most affected by an environmental factor.	D
27	<i>Ecology</i>	HS.LS.2.4	C. Evidence, Reasoning, and Modeling	SR	Describe how energy is transferred in an ecosystem based on an energy pyramid.	B
28	<i>Molecules to Organisms</i>	HS.LS.1.3	C. Evidence, Reasoning, and Modeling	SR	Explain how adding salt water to plant cells affects the amount of water inside the cells and identify the process responsible for the movement of water.	see page 8

29	<i>Heredity</i>	HS.LS.3.4	C. Evidence, Reasoning, and Modeling	SR	Explain that certain plants are able to produce a toxic substance due to an environmental factor.	D
30	<i>Molecules to Organisms</i>	HS.LS.1.5	None	SR	Explain how photosynthesis by algae living inside coral cells helps the coral.	B
31	<i>Molecules to Organisms</i>	HS.LS.1.2	None	SR	Identify digestive system organs most directly affected by certain conditions.	see page 9
32	<i>Molecules to Organisms</i>	HS.LS.1.6	None	SR	Identify the monomer that makes up antibodies.	see page 9
33	<i>Heredity</i>	HS.LS.3.3	None	SR	Determine which two genotypes code for the same phenotype.	A,C
34	<i>Evolution</i>	HS.LS.4.2	C. Evidence, Reasoning, and Modeling	SR	Explain how natural selection could have resulted in a population having several phenotypes for a certain trait.	D
35	<i>Molecules to Organisms</i>	HS.LS.1.3	C. Evidence, Reasoning, and Modeling	SR	Interpret a model to evaluate claims and explain feedback mechanisms that maintain homeostasis in the given situation.	see page 9
36	<i>Heredity</i>	HS.LS.3.3	B. Mathematics and Data	CR	Complete a Punnett square to predict offspring phenotypes, identify and explain the expected percentage of a phenotype, and identify and explain possible genotypes of parents based on an offspring with a certain phenotype.	
37	<i>Evolution</i>	HS.LS.4.4	B. Mathematics and Data	SR	Analyze a data table to explain why viruses adapt to environmental changes faster than other organisms.	see page 9
38	<i>Ecology</i>	HS.LS.2.5	None	SR	Identify two ways that photosynthesis supports life on Earth.	A,E

39	<i>Molecules to Organisms</i>	HS.LS.1.4	C. Evidence, Reasoning, and Modeling	SR	Complete a model of the cell cycle by identifying an event that occurs during interphase.	see page 10
40	<i>Molecules to Organisms</i>	HS.LS.1.2	None	SR	Describe the primary function of the kidneys and explain how the kidneys help to maintain homeostasis in the human body.	A;B
41	<i>Evolution</i>	HS.LS.4.1	C. Evidence, Reasoning, and Modeling	CR	Interpret a cladogram to identify the most closely related species and explain how different types of evidence can be used to determine evolutionary relatedness.	

* The 2026 Biology test results were reported using 58 points instead of 60 points. DESE excluded one two-point test question that students reported having technology difficulties with during test administration. This question did not count toward any student's score.

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

*** Answers are provided here for selected-response items only. Pages 7–10 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.

Correct Answer for CBT Item #1: Technology-Enhanced Item

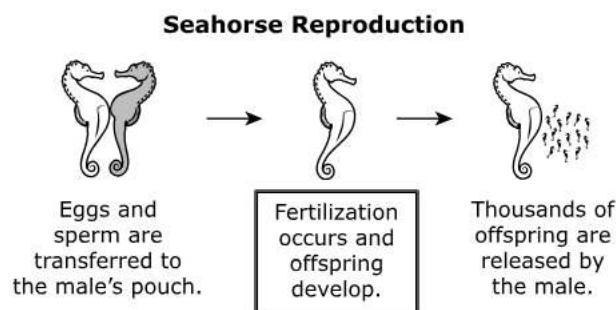
Based on the gardener's data, the flower color of hydrangea X is most likely a result of

The flower color of hydrangea Y is most likely a result of

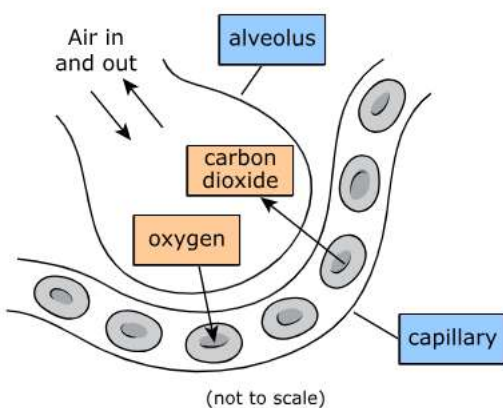
Correct Answer for CBT Item #5: Technology-Enhanced Item

The scientist's claim is by the graph because in the area with cycad trees there is nitrogen available for plants to make

Correct Answer for CBT Item #8: Technology-Enhanced Item



Correct Answer for CBT Item #10: Technology-Enhanced Item



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

Based on the information, the inheritance pattern of coat variation in cheetahs is most likely

dominant-recessive

and the allele for king coat is

recessive.

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

Part B

The carrying capacity for cheetahs in Africa has

decreased

because habitat destruction

decreased

the amount of food available to

the antelopes and zebras.

Correct Answer for CBT Item #17: Technology-Enhanced Item

The results show that the plants exposed to

red

light performed the most

photosynthesis.

Therefore, these plants also produced the most

oxygen.

Correct Answer for CBT Item #21: Technology-Enhanced Item

The product missing from the model is

ATP.

This product provides

usable energy

for life processes

in cells.

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

Egg cells are made in the process of meiosis. During meiosis, the nucleus is divided two times and four cells are produced. This results in haploid egg cells. Each egg cell is identical to ensure the same genetic information is passed to the offspring.

Correct Answer for CBT Item #28: Technology-Enhanced Item

The amount of water inside the cells

decreased

as a result of

osmosis.

Correct Answer for CBT Item #31: Technology-Enhanced Item

Condition	Large Intestine	Small Intestine	Stomach
Acid produced by this organ begins to dissolve some of its tissue lining.	☐	☐	☒
Infection of this organ slows the absorption of nutrients into the bloodstream.	☐	☒	☐

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

The antibodies produced by a person's immune system are made up of

Correct Answer for CBT Item #35: Technology-Enhanced Item

Part A

Claim	Supported	Not Supported
Kidneys decrease the amount of O ₂ produced.	☐	☒
EPO is released when blood O ₂ levels are above normal.	☐	☒
Red blood cell production begins to increase when O ₂ blood levels decrease.	☒	☐

Part B

Once blood O₂ levels have been restored to normal, the level of EPO to the number of red blood cells in the body.

Correct Answer for CBT Item #37: Technology-Enhanced Item

The virus is able to adapt to environmental changes because the virus has a compared with the bacterium or fungus.

Correct Answer for CBT Item #39: Technology-Enhanced Item

