MASSACHUSETTS
Department of Elementary
and Secondary Education

Release of MCAS Test Information from the February 2026 Biology and Introductory Physics Tests

April 2026
Massachusetts Department of Elementary and Secondary Education

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Department of Elementary
and Secondary Education

This document was prepared by the
Massachusetts Department of Elementary and Secondary Education
Pedro Martinez
Commissioner

Massachusetts Department of Elementary and Secondary Education
135 Santilli Highway, Everett, MA 02149-1950
Phone 781-338-3000 TTY: N.E.T. Relay 800-439-2370
www.doe.mass.edu

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I. Document Purpose and Structure

Document Purpose and Structure

Purpose

The purpose of this document is to share with educators and the public information regarding the February 2026 MCAS Biology and Introductory Physics tests, including the reporting category and standard associated with each item. The Department does not currently release items from the February Biology and Introductory Physics tests. All items continue to be released for the spring Biology and Introductory Physics tests.

Structure

Chapters II and III of this document contain, respectively, information for the February 2026 Biology and Introductory Physics tests. Each of these chapters has two sections.

The **first section** provides a brief overview of the test, including test format and item types. The Introductory Physics Reference Sheet used by students during MCAS Introductory Physics test sessions appears at the end of the first section of the Introductory Physics chapter.

The **second section** of each chapter are tables that cross-reference each item on the computer-based test and the paper-based test with its MCAS reporting category and with the *Framework* standard it assesses. The tables show how the items on the test assess standards in the 2016 *Massachusetts Science and Technology/Engineering Curriculum Framework*.

II. February 2026 Biology Test

February 2026 High School Biology Test

The February 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.

Most of the operational items on the high school 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.

Test Sessions and Content Overview

The high school Biology test was made up of two separate test sessions. Each session included selected-response questions and constructed-response questions. On the paper-based test, the selected-response questions were multiple-choice items and multiple-select items, in which students select the correct answer(s) from among several answer options.

Standards and Reporting Categories

The high school MCAS Biology test was based on learning standards in the 2016 *Massachusetts Science and Technology/Engineering Curriculum Framework*. The Framework is available on the Department website at www.doe.mass.edu/frameworks/current.html.

The biology standards are grouped under the four content reporting categories listed below.

- Molecules to Organisms
- Heredity
- Evolution
- Ecosystems

Most items on the high school Biology test are also reported as aligning to one of three MCAS Science Practice Categories. The three practice categories are listed below.

- Practice Category A: Investigations and Questioning
- Practice Category B: Mathematics and Data
- Practice Category C: Evidence, Reasoning, and Modeling

More information about the practice categories is available on the Department website at www.doe.mass.edu/mcas/tdd/practice-categories.html.

The tables at the conclusion of this chapter provides the following information about each released operational item: reporting category, standard covered, science practice category covered (if any), item type, and item description.

Spanish-Language Edition

Since approximately 52% of English learner students in Massachusetts public schools are native Spanish speakers, a Spanish-language edition of the February Biology test was made available to eligible Spanish-speaking students. The computer-based version of the Spanish-language edition presented the Spanish translation above the English text for each item. The booklets for the paper-based version of the Spanish-language edition were issued in side-by-side English/Spanish format: pages on the left side of each booklet presented items in Spanish; pages on the right side presented the same items in English.

Reference Materials and Tools

Each student taking the high school Biology test had sole access to a calculator.

During both Biology test sessions, the use of authorized bilingual word-to-word dictionaries and glossaries was allowed for students who are currently or were ever reported as English learners.

February 2026 Biology
Computer-Based Operational Items

CBT Item No.	Reporting Category	Standard	Science Practice Category	Item Type*	Item Description
1	*Molecules to Organisms*	HS.LS.1.5	C. Evidence, Reasoning, and Modeling	SR	Interpret several models to determine which one best shows the inputs and outputs of photosynthesis.
2	*Ecology*	HS.LS.2.4	C. Evidence, Reasoning, and Modeling	SR	Interpret information from a table to complete a food web.
3	*Molecules to Organisms*	HS.LS.1.2	None	SR	Order the pathway in which a signal moves through the nervous system.
4	*Heredity*	HS.LS.3.2	C. Evidence, Reasoning, and Modeling	SR	Analyze a model of homologous chromosomes to determine the cause of new phenotype combinations in gametes.
5	*Heredity*	HS.LS.3.3	C. Evidence, Reasoning, and Modeling	SR	Analyze information for the inheritance of two traits to determine which hybrid cross would produce offspring with a specific phenotype.
6	*Molecules to Organisms*	HS.LS.1.6	None	SR	Interpret a data table to determine which food contains the most amino acids, and describe how lipids are used by the body.
7	*Ecology*	HS.LS.2.6	C. Evidence, Reasoning, and Modeling	SR	Determine an action that would increase genetic variation in a population.
8	*Ecology*	HS.LS.2.4	B. Mathematics and Data	SR	Calculate the amounts of energy stored in two trophic levels to complete an energy pyramid.
9	*Evolution*	HS.LS.4.5	None	SR	Determine the cause of an increase of a phenotype in a population of organisms in which the fitness of individuals in the population did not increase.
10	*Ecology*	HS.LS.2.1	B. Mathematics and Data	SR	Interpret a graph to determine the carrying capacity of the ecosystem for a population.
11	*Heredity*	HS.LS.3.2	C. Evidence, Reasoning, and Modeling	SR	Analyze a situation to determine the maximum number of mutated alleles a child could inherit.
12	*Ecology*	HS.LS.2.1	C. Evidence, Reasoning, and Modeling	SR	Interpret a food web to determine which species are competitors.
13	*Heredity*	HS.LS.3.3	B. Mathematics and Data	SR	Determine the probability of an organism inheriting a specific trait.
14	*Heredity*	HS.LS.3.4	A. Investigations and Questioning	SR	Explain how a genetic trait can be affected by the environment.
15	*Heredity*	HS.LS.3.1	C. Evidence, Reasoning, and Modeling	SR	Complete a model to show the number of chromosomes in the cells involved in sexual reproduction, and identify the processes involved in sexual reproduction.
16	*Heredity*	HS.LS.3.3	C. Evidence, Reasoning, and Modeling	CR	Complete a Punnett square for a specific cross, determine the probability of offspring with a certain trait, compare the expected percentage with the actual percentage of offspring with the trait, and explain why the percentages are different.
17	*Evolution*	HS.LS.4.4	None	SR	Identify characteristics responsible for the genetic diversity of bacteria.
18	*Molecules to Organisms*	HS.LS.1.4	None	SR	Explain the importance of DNA replication.
19	*Molecules to Organisms*	HS.LS.1.6	C. Evidence, Reasoning, and Modeling	SR	Identify a type of organic molecule based on its function and molecular structure.

CBT Item No.	Reporting Category	Standard	Science Practice Category	Item Type*	Item Description
20	*Ecology*	HS.LS.2.4	C. Evidence, Reasoning, and Modeling	CR	Interpret a food web to determine which organisms use sunlight to produce food, explain why there is a difference in the amount of energy available in two populations, describe what will happen to a population when the environment changes, and explain how that change will affect the amount of energy available to another population.
21	*Molecules to Organisms*	HS.LS.1.1	C. Evidence, Reasoning, and Modeling	CR	Identify the mRNA sequence and amino acid sequence for a given DNA sequence, explain how a mutation can change the structure and function of a protein, and explain how a different mutation would not cause a change in the protein.
22	*Evolution*	HS.LS.4.1	C. Evidence, Reasoning, and Modeling	SR	Analyze information about eye structures to determine the best evidence that two species share a common ancestor.
23	*Evolution*	HS.LS.4.2	C. Evidence, Reasoning, and Modeling	SR	Determine which evidence best supports a claim that natural selection is occurring in a population.
24	*Molecules to Organisms*	HS.LS.1.7	C. Evidence, Reasoning, and Modeling	SR	Complete a model of the inputs and outputs of a cellular process that occurs in a certain organelle.
25	*Molecules to Organisms*	HS.LS.1.2	None	SR	Describe ways a certain condition affects the circulatory system and identify an organ that is responsible for maintaining water balance.
26	*Heredity*	HS.LS.3.3	C. Evidence, Reasoning, and Modeling	SR	Analyze a pedigree chart to calculate the probability of an offspring inheriting a condition.
27	*Heredity*	HS.LS.3.1	B. Mathematics and Data	SR	Determine the number of chromosomes in a body cell based on the number of chromosomes in a gamete.
28	*Ecology*	HS.LS.2.7	C. Evidence, Reasoning, and Modeling	SR	Identify evidence that supports a claim that an organism is an invasive species.
29	*Evolution*	HS.LS.4.1	C. Evidence, Reasoning, and Modeling	SR	Determine which evidence best supports that an extinct organism and a living organism are closely related.
30	*Evolution*	HS.LS.4.4	None	SR	Identify how a virus was able to infect a species of bacteria.
31	*Molecules to Organisms*	HS.LS.1.1	None	SR	Determine which nucleotide base has the same percentage as a second nucleotide base in a DNA molecule.
32	*Heredity*	HS.LS.3.3	None	SR	Determine the inheritance pattern for a certain trait.
33	*Evolution*	HS.LS.4.2	None	SR	Describe an advantage of related species that live in the same area having different mouth structures.
34	*Molecules to Organisms*	HS.LS.1.2	None	SR	Identify the body system that an organism uses to detect the color of a potential mate.
35	*Ecology*	HS.LS.2.4	C. Evidence, Reasoning, and Modeling	SR	Determine the ecological role of an organism and compare the relative amount of energy stored in two trophic levels.
36	*Molecules to Organisms*	HS.LS.1.1	None	SR	Determine an mRNA sequence based on a DNA sequence and describe where in the cell the mRNA sequence will be translated into an amino acid.
37	*Evolution*	HS.LS.4.2	None	CR	Describe a disadvantage of a trait in a population, and explain how a trait can become more common in a population due to natural selection.
38	*Ecology*	HS.LS.2.5	B. Mathematics and Data	SR	Interpret a graph to determine that decomposition occurred over time.

CBT Item No.	Reporting Category	Standard	Science Practice Category	Item Type*	Item Description
39	*Evolution*	HS.LS.4.4	C. Evidence, Reasoning, and Modeling	SR	Interpret data about the changes in DNA to support a conclusion about a virus.
40	*Evolution*	HS.LS.4.5	None	SR	Compare the genetic variation in an island population to the genetic variation in a mainland population.
41	*Heredity*	HS.LS.3.2	None	SR	Describe the process of meiosis, how mutations can occur during mitosis and meiosis, and that only mutations resulting from meiosis may be passed to offspring.
42	*Molecules to Organisms*	HS.LS.1.3	C. Evidence, Reasoning, and Modeling	CR	Interpret a model to determine the types of cell membrane transport for three molecules, describe what happens in an animal cell when too much water leaves a cell, and explain why ATP is included in the model.

* Science and Technology/Engineering item types are: selected-response (SR) and constructed-response (CR).

February 2026 Biology
Paper-Based Operational Items

PBT Item No.	Reporting Category	Standard	Science Practice Category	Item Type*	Item Description
1	*Molecules to Organisms*	HS.LS.1.5	C. Evidence, Reasoning, and Modeling	SR	Interpret several models to determine which one best shows the inputs and outputs of photosynthesis.
2	*Ecology*	HS.LS.2.4	C. Evidence, Reasoning, and Modeling	SR	Interpret information from a table to identify the food web for an ecosystem.
3	*Molecules to Organisms*	HS.LS.1.2	None	SR	Order the pathway in which a signal moves through the nervous system.
4	*Heredity*	HS.LS.3.2	C. Evidence, Reasoning, and Modeling	SR	Analyze a model of homologous chromosomes to identify the phenotype combinations that could be produced from crossing over and from chromosomes separating.
5	*Heredity*	HS.LS.3.3	C. Evidence, Reasoning, and Modeling	SR	Analyze information for the inheritance of two traits to determine which hybrid cross would produce offspring with a specific phenotype.
6	*Molecules to Organisms*	HS.LS.1.6	None	SR	Interpret a data table to determine which food contains the most amino acids, and describe how lipids are used by the body.
7	*Ecology*	HS.LS.2.6	C. Evidence, Reasoning, and Modeling	SR	Determine an action that would increase genetic variation in a population.
8	*Ecology*	HS.LS.2.4	B. Mathematics and Data	SR	Calculate the amounts of energy stored in two trophic levels to complete an energy pyramid.
9	*Evolution*	HS.LS.4.5	None	SR	Determine the cause of an increase of a phenotype in a population of organisms in which the fitness of individuals in the population did not increase.
10	*Ecology*	HS.LS.2.1	B. Mathematics and Data	SR	Interpret a graph to determine the carrying capacity of the ecosystem for a population.
11	*Heredity*	HS.LS.3.2	C. Evidence, Reasoning, and Modeling	SR	Analyze a situation to determine the maximum number of mutated alleles a child could inherit.
12	*Ecology*	HS.LS.2.1	C. Evidence, Reasoning, and Modeling	SR	Interpret a food web to determine which species are competitors.
13	*Heredity*	HS.LS.3.3	B. Mathematics and Data	SR	Determine the probability of an organism inheriting a specific trait.
14	*Heredity*	HS.LS.3.4	A. Investigations and Questioning	SR	Explain how a genetic trait can be affected by the environment.
15	*Heredity*	HS.LS.3.1	C. Evidence, Reasoning, and Modeling	SR	Identify a model to show the number of chromosomes in the cells involved in sexual reproduction, and identify the processes involved in sexual reproduction.
16	*Heredity*	HS.LS.3.3	C. Evidence, Reasoning, and Modeling	CR	Complete a Punnett square for a specific cross, determine the probability of offspring with a certain trait, compare the expected percentage with the actual percentage of offspring with the trait, and explain why the percentages are different.
17	*Evolution*	HS.LS.4.4	None	SR	Identify characteristics responsible for the genetic diversity of bacteria.
18	*Molecules to Organisms*	HS.LS.1.4	None	SR	Explain the importance of DNA replication.
19	*Molecules to Organisms*	HS.LS.1.6	C. Evidence, Reasoning, and Modeling	SR	Identify a type of organic molecule based on its function and molecular structure.

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21	*Molecules to Organisms*	HS.LS.1.1	C. Evidence, Reasoning, and Modeling	CR	Identify the mRNA sequence and amino acid sequence for a given DNA sequence, explain how a mutation can change the structure and function of a protein, and explain how a different mutation would not cause a change in the protein.
22	*Evolution*	HS.LS.4.1	C. Evidence, Reasoning, and Modeling	SR	Analyze information about eye structures to determine the best evidence that two species share a common ancestor.
23	*Evolution*	HS.LS.4.2	C. Evidence, Reasoning, and Modeling	SR	Determine which evidence best supports a claim that natural selection is occurring in a population.
24	*Molecules to Organisms*	HS.LS.1.7	C. Evidence, Reasoning, and Modeling	SR	Complete a model of the inputs and outputs of a cellular process that occurs in a certain organelle.
25	*Molecules to Organisms*	HS.LS.1.2	None	SR	Describe ways a certain condition affects the circulatory system and identify an organ that is responsible for maintaining water balance.
26	*Heredity*	HS.LS.3.3	C. Evidence, Reasoning, and Modeling	SR	Analyze a pedigree chart to calculate the probability of an offspring inheriting a condition.
27	*Heredity*	HS.LS.3.1	B. Mathematics and Data	SR	Determine the number of chromosomes in a body cell based on the number of chromosomes in a gamete.
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36	*Molecules to Organisms*	HS.LS.1.1	None	SR	Determine an mRNA sequence based on a DNA sequence and describe where in the cell the mRNA sequence will be translated into an amino acid.
37	*Evolution*	HS.LS.4.2	None	CR	Describe a disadvantage of a trait in a population, and explain how a trait can become more common in a population due to natural selection.
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* Science and Technology/Engineering item types are: selected-response (SR) and constructed-response (CR).

III. February 2026 Introductory Physics Test

February 2026 High School Introductory Physics Test

The February 2026 high school Introductory Physics 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.

Most of the operational items on the high school Introductory Physics 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.

Test Sessions and Content Overview

The high school Introductory Physics test was made up of two separate test sessions. Each session included selected-response questions and constructed-response questions. On the paper-based test, the selected-response questions were multiple-choice items and multiple-select items, in which students select the correct answer(s) from among several answer options.

Standards and Reporting Categories

The high school Introductory Physics test was based on learning standards in the 2016 *Massachusetts Science and Technology/Engineering Curriculum Framework*. The Framework is available on the Department website at www.doe.mass.edu/frameworks/current.html.

The introductory physics standards are grouped under the three content reporting categories listed below. Note that standard HS.PHY.1.8 is included in the Energy reporting category.

- Motion, Forces, and Interactions
- Energy
- Waves

Most items on the high school Introductory Physics test are also reported as aligning to one of three MCAS Science Practice Categories. The three practice categories are listed below.

- Practice Category A: Investigations and Questioning
- Practice Category B: Mathematics and Data
- Practice Category C: Evidence, Reasoning, and Modeling

More information about the practice categories is available on the Department website at www.doe.mass.edu/mcas/tdd/practice-categories.html.

The tables at the conclusion of this chapter provides the following information about each released operational item: reporting category, standard covered, science practice category covered (if any), item type, and item description.

Spanish-Language Edition

Since approximately 52% of English learner students in Massachusetts public schools are native Spanish speakers, a Spanish-language edition of the February Introductory Physics test was made available to eligible Spanish-speaking students. The computer-based version of the Spanish-language edition presented the Spanish translation above the English text for each item. The booklets for the paper-based version of the Spanish-language edition were issued in side-by-side English/Spanish format: pages on the left side of each booklet presented items in Spanish; pages on the right side presented the same items in English.

Reference Materials

Each student taking the high school Introductory Physics test was provided with an Introductory Physics Reference Sheet. A copy of the reference sheet is provided on the next page. Each student also had sole access to a calculator.

During both high school Introductory Physics test sessions, the use of authorized bilingual word-to-word dictionaries and glossaries was allowed for students who are currently or were ever reported as English learners.

MASSACHUSETTS Department of Elementary and Secondary Education

Massachusetts Comprehensive Assessment System
Introductory Physics Reference Sheet

Formulas

$s_{average} = \frac{d}{\Delta t}$

$v_{average} = \frac{\Delta x}{\Delta t}$

$a_{average} = \frac{\Delta v}{\Delta t}$

$v_f = v_i + a\Delta t$

$\Delta x = v_i\Delta t + \frac{1}{2}a\Delta t^2$

$p = mv$

$F\Delta t = \Delta p$

$F_{net} = ma$

$F_g = mg$

$F_g = G\frac{m_1 m_2}{d^2}$

$F_e = k\frac{q_1 q_2}{d^2}$

$KE = \frac{1}{2}mv^2$

$\Delta PE = mg\Delta h$

$W = \Delta E = Fd$

$eff = \frac{E_{out}}{E_{in}}$

$Q = mc\Delta T$

$v = \lambda f$

$T = \frac{1}{f}$

$V = IR$

Variables

a = acceleration
c = specific heat
d = distance
E = energy
eff = efficiency
f = frequency
F = force
g = acceleration due to gravity
Δh = change in height
I = current
KE = kinetic energy
λ = wavelength
m = mass
p = momentum
ΔPE = change in gravitational potential energy
q = charge of particle
Q = heat added or removed
R = resistance
s = speed
Δt = change in time
T = period
ΔT = change in temperature
v = velocity
V = potential difference (voltage)
W = work
Δx = change in position (displacement)

Unit Symbols

ampere, A
coulomb, C
degree Celsius, °C
hertz, Hz
joule, J
kilogram, kg
meter, m
newton, N
ohm, Ω
second, s
volt, V

Definitions

speed of electromagnetic waves in a vacuum = 3×10^8 m/s

G = Universal gravitational constant = $6.7 \times 10^{-11} \frac{N \cdot m^2}{kg^2}$

k = Coulomb's constant = $9 \times 10^9 \frac{N \cdot m^2}{C^2}$

g ≈ 10 m/s² at Earth's surface

$1\ N = 1\frac{kg \cdot m}{s^2}$

1 J = 1 N • m

February 2026 Introductory Physics Computer-Based Operational Items

CBT Item No.	Reporting Category	Standard	Science Practice Category	Item Type*	Item Description
1	*Motion, Forces, and Interactions*	HS.PHY.2.2	B. Mathematics and Data	SR	Order the momentums of three cars from least to greatest.
2	*Waves*	HS.PHY.4.1	C. Evidence, Reasoning, and Modeling	SR	Describe how only light, and not sound, is observed during an explosion in outer space.
3	*Motion, Forces, and Interactions*	HS.PHY.2.1	B. Mathematics and Data	SR	Determine how a velocity vs. time graph for an object pulled with a constant net force compares with a velocity vs. time graph for an object that has a smaller mass and is pulled with the same net force.
4	*Motion, Forces, and Interactions*	HS.PHY.2.5	C. Evidence, Reasoning, and Modeling	SR	Interpret a diagram to determine why a compass needle changes direction.
5	*Energy*	HS.PHY.3.2	B. Mathematics and Data	SR	Interpret temperature data of a substance to determine when the substance was completely a liquid.
6	*Energy*	HS.PHY.3.5	C. Evidence, Reasoning, and Modeling	SR	Describe the accelerations of two charges and the electric forces between them after they are released from rest.
7	*Motion, Forces, and Interactions*	HS.PHY.2.1	C. Evidence, Reasoning, and Modeling	SR	Interpret a position over time diagram to describe an object's velocity and the net force on it, and determine how increasing the object's mass affected its motion.
8	*Motion, Forces, and Interactions*	HS.PHY.2.2	B. Mathematics and Data	SR	Determine the momentums of two objects before and after a collision.
9	*Motion, Forces, and Interactions*	HS.PHY.2.3	None	SR	Describe how the materials for a case design protect an object during a collision.
10	*Energy*	HS.PHY.3.5	C. Evidence, Reasoning, and Modeling	SR	Interpret models of magnetic field lines to determine which model represents the field between two magnets, and describe the change in forces and energy as the magnets move farther apart.
11	*Motion, Forces, and Interactions*	HS.PHY.2.9	C. Evidence, Reasoning, and Modeling	SR	Describe changes to a circuit that would result in light bulbs in the circuit becoming brighter.
12	*Motion, Forces, and Interactions*	HS.PHY.2.3	B. Mathematics and Data	SR	Calculate the mass of an object that changes its velocity due to a collision.
13	*Motion, Forces, and Interactions*	HS.PHY.2.1	B. Mathematics and Data	SR	Determine the magnitude of an applied force acting on an object from the mass, acceleration, and other forces acting on the object.
14	*Energy*	HS.PHY.3.1	None	SR	Use a diagram to identify the type of energy stored in an object.
15	*Waves*	HS.PHY.4.5	C. Evidence, Reasoning, and Modeling	SR	Describe what happens when two waves destructively interfere.
16	*Waves*	HS.PHY.4.5	C. Evidence, Reasoning, and Modeling	SR	Compare the speeds and wavelengths of light traveling through different media.
17	*Motion, Forces, and Interactions*	HS.PHY.2.10	A. Investigations and Questioning	CR	Explain why conducting multiple trials in an investigation is important, describe how to determine the speed of a wave pulse, and explain why a claim about wave pulses is not supported by given data.

CBT Item No.	Reporting Category	Standard	Science Practice Category	Item Type*	Item Description
18	*Motion, Forces, and Interactions*	HS.PHY.2.9	B. Mathematics and Data	SR	Determine which circuit component should be added to a series circuit for the circuit to have a given amount of current.
19	*Motion, Forces, and Interactions*	HS.PHY.2.4	B. Mathematics and Data	SR	Determine how the gravitational force between two objects is affected when the mass of both of the objects is increased.
20	*Energy*	HS.PHY.3.3	C. Evidence, Reasoning, and Modeling	CR	Analyze three designs and a temperature vs. time graph to explain the output energies for two designs, identify which design had the greatest efficiency and explain why, and explain how adding insulation to one of the designs would affect its maximum temperature.
21	*Waves*	HS.PHY.4.1	B. Mathematics and Data	CR	Calculate the period and wavelength of a sound wave, identify whether certain wave properties are affected by the sound wave's amplitude changing, and explain why the sound wave's wavelength changes as it travels into a new medium.
22	*Energy*	HS.PHY.1.8	C. Evidence, Reasoning, and Modeling	SR	Determine the number of neutrons in the product of a nuclear decay process.
23	*Waves*	HS.PHY.4.1	B. Mathematics and Data	SR	Interpret a diagram to compare the properties of two waves.
24	*Energy*	HS.PHY.3.3	B. Mathematics and Data	SR	Calculate the amount of energy a device produces using the input energy and the efficiency of the device.
25	*Waves*	HS.PHY.4.3	None	SR	Determine which frequency of light will cause electrons to be ejected with the highest velocity from a metal surface, and compare the photons that make up two frequencies of light.
26	*Energy*	HS.PHY.3.1	B. Mathematics and Data	SR	Calculate the amount of work done on an object.
27	*Motion, Forces, and Interactions*	HS.PHY.2.10	C. Evidence, Reasoning, and Modeling	SR	Determine which free-body force diagram represents an object with the greatest acceleration.
28	*Motion, Forces, and Interactions*	HS.PHY.2.10	B. Mathematics and Data	SR	Calculate the velocity of an object that has constant acceleration after a given time period.
29	*Motion, Forces, and Interactions*	HS.PHY.2.9	C. Evidence, Reasoning, and Modeling	SR	Interpret three series circuits to order them from least to greatest current.
30	*Motion, Forces, and Interactions*	HS.PHY.2.4	C. Evidence, Reasoning, and Modeling	SR	Interpret a diagram to determine an object's charge and how decreasing the distance between it and another object will affect the electrostatic forces between them.
31	*Motion, Forces, and Interactions*	HS.PHY.2.3	B. Mathematics and Data	SR	Compare the forces two objects exert on each other during a collision, and calculate the magnitude of the force.
32	*Motion, Forces, and Interactions*	HS.PHY.2.2	C. Evidence, Reasoning, and Modeling	SR	Describe the motion of two ice skaters after they collide.
33	*Motion, Forces, and Interactions*	HS.PHY.2.1	C. Evidence, Reasoning, and Modeling	SR	Interpret a velocity vs. time graph to describe the net force on an object during multiple time intervals.

CBT Item No.	Reporting Category	Standard	Science Practice Category	Item Type*	Item Description
34	*Energy*	HS.PHY.3.4	C. Evidence, Reasoning, and Modeling	SR	Compare the amount of thermal energy required to increase the temperature of two substances, and identify the direction of thermal energy transfer.
35	*Motion, Forces, and Interactions*	HS.PHY.2.9	B. Mathematics and Data	SR	Calculate the resistance of a light bulb in a parallel circuit given the current through the light bulb.
36	*Motion, Forces, and Interactions*	HS.PHY.2.9	C. Evidence, Reasoning, and Modeling	SR	Interpret a diagram to determine which switches should be closed in a parallel circuit for the greatest total current to flow through the circuit's battery.
37	*Waves*	HS.PHY.4.1	B. Mathematics and Data	SR	Calculate the wavelength of a wave.
38	*Energy*	HS.PHY.3.1	C. Evidence, Reasoning, and Modeling	CR	Analyze a circuit diagram to describe two energy transformations that occur in a circuit, and explain how two circuit components are affected when the resistance and voltage of the circuit are changed.
39	*Waves*	HS.PHY.4.5	None	SR	Interpret a diagram to identify a wave behavior that an electronic device uses.
40	*Motion, Forces, and Interactions*	HS.PHY.2.4	C. Evidence, Reasoning, and Modeling	SR	Determine how the gravitational force on an object changes when its distance to another object is changed.
41	*Energy*	HS.PHY.3.2	B. Mathematics and Data	SR	Compare the kinetic energies of two people with different masses.
42	*Energy*	HS.PHY.3.5	C. Evidence, Reasoning, and Modeling	SR	Analyze pairs of charges to determine the pair that experiences the greatest repulsive force.
43	*Motion, Forces, and Interactions*	HS.PHY.2.10	B. Mathematics and Data	CR	Explain how the magnitudes of the gravitational force and the upward force on an object compare, calculate the magnitude of the object's acceleration, and calculate the magnitudes of the net force and the upward force on the object.

* Science and Technology/Engineering item types are: selected-response (SR) and constructed-response (CR).

February 2026 Introductory Physics Paper-Based Operational Items

PBT Item No.	Reporting Category	Standard	Science Practice Category	Item Type*	Item Description
1	*Motion, Forces, and Interactions*	HS.PHY.2.2	B. Mathematics and Data	SR	Order the momentums of three cars from least to greatest.
2	*Waves*	HS.PHY.4.1	C. Evidence, Reasoning, and Modeling	SR	Describe how only light, and not sound, is observed during an explosion in outer space.
3	*Motion, Forces, and Interactions*	HS.PHY.2.1	B. Mathematics and Data	SR	Determine how a velocity vs. time graph for an object pulled with a constant net force compares with a velocity vs. time graph for an object that has a smaller mass and is pulled with the same net force.
4	*Motion, Forces, and Interactions*	HS.PHY.2.5	C. Evidence, Reasoning, and Modeling	SR	Interpret a diagram to determine why a compass needle changes direction.
5	*Energy*	HS.PHY.3.2	B. Mathematics and Data	SR	Interpret temperature data of a substance to determine when the substance was completely a liquid.
6	*Energy*	HS.PHY.3.5	C. Evidence, Reasoning, and Modeling	SR	Describe the accelerations of two charges and the electric forces between them after they are released from rest.
7	*Motion, Forces, and Interactions*	HS.PHY.2.1	C. Evidence, Reasoning, and Modeling	SR	Interpret a position over time diagram to describe an object's velocity and the net force on it, and determine how increasing the object's mass affected its motion.
8	*Motion, Forces, and Interactions*	HS.PHY.2.2	B. Mathematics and Data	SR	Determine the momentums of two objects before and after a collision.
9	*Motion, Forces, and Interactions*	HS.PHY.2.3	None	SR	Describe how the materials for a case design protect an object during a collision.
10	*Energy*	HS.PHY.3.5	C. Evidence, Reasoning, and Modeling	SR	Interpret models of magnetic field lines to determine which model represents the field between two magnets, and describe the change in forces and energy as the magnets move farther apart.
11	*Motion, Forces, and Interactions*	HS.PHY.2.9	C. Evidence, Reasoning, and Modeling	SR	Describe changes to a circuit that would result in light bulbs in the circuit becoming brighter.
12	*Motion, Forces, and Interactions*	HS.PHY.2.3	B. Mathematics and Data	SR	Calculate the mass of an object that changes its velocity due to a collision.
13	*Motion, Forces, and Interactions*	HS.PHY.2.1	B. Mathematics and Data	SR	Determine the magnitude of an applied force acting on an object from the mass, acceleration, and other forces acting on the object.
14	*Energy*	HS.PHY.3.1	None	SR	Use a diagram to identify the type of energy stored in an object.
15	*Waves*	HS.PHY.4.5	C. Evidence, Reasoning, and Modeling	SR	Describe what happens when two waves destructively interfere.
16	*Waves*	HS.PHY.4.5	C. Evidence, Reasoning, and Modeling	SR	Compare the speeds and wavelengths of light traveling through different media.
17	*Motion, Forces, and Interactions*	HS.PHY.2.10	A. Investigations and Questioning	CR	Explain why conducting multiple trials in an investigation is important, describe how to determine the speed of a wave pulse, and explain why a claim about wave pulses is not supported by given data.

PBT Item No.	Reporting Category	Standard	Science Practice Category	Item Type*	Item Description
18	*Motion, Forces, and Interactions*	HS.PHY.2.9	B. Mathematics and Data	SR	Determine which circuit component should be added to a series circuit for the circuit to have a given amount of current.
19	*Motion, Forces, and Interactions*	HS.PHY.2.4	B. Mathematics and Data	SR	Determine how the gravitational force between two objects is affected when the mass of both of the objects is increased.
20	*Energy*	HS.PHY.3.3	C. Evidence, Reasoning, and Modeling	CR	Analyze three designs and a temperature vs. time graph to explain the output energies for two designs, identify which design had the greatest efficiency and explain why, and explain how adding insulation to one of the designs would affect its maximum temperature.
21	*Waves*	HS.PHY.4.1	B. Mathematics and Data	CR	Calculate the period and wavelength of a sound wave, identify whether certain wave properties are affected by the sound wave's amplitude changing, and explain why the sound wave's wavelength changes as it travels into a new medium.
22	*Energy*	HS.PHY.1.8	C. Evidence, Reasoning, and Modeling	SR	Determine the number of neutrons in the product of a nuclear decay process.
23	*Waves*	HS.PHY.4.1	B. Mathematics and Data	SR	Interpret a diagram to compare the properties of two waves.
24	*Energy*	HS.PHY.3.3	B. Mathematics and Data	SR	Calculate the amount of energy a device produces using the input energy and the efficiency of the device.
25	*Waves*	HS.PHY.4.3	None	SR	Determine which frequency of light will cause electrons to be ejected with the highest velocity from a metal surface, and compare the photons that make up two frequencies of light.
26	*Energy*	HS.PHY.3.1	B. Mathematics and Data	SR	Calculate the amount of work done on an object.
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32	*Motion, Forces, and Interactions*	HS.PHY.2.2	C. Evidence, Reasoning, and Modeling	SR	Describe the motion of two ice skaters after they collide.
33	*Motion, Forces, and Interactions*	HS.PHY.2.1	C. Evidence, Reasoning, and Modeling	SR	Interpret a velocity vs. time graph to describe the net force on an object during multiple time intervals.

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35	*Motion, Forces, and Interactions*	HS.PHY.2.9	B. Mathematics and Data	SR	Calculate the resistance of a light bulb in a parallel circuit given the current through the light bulb.
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