TEST ASSESSING
SECONDARY COMPLETION™

TASC Science Sample Test Items

Mc Graw Hill Education | CTB

TEST ASSESSING SECONDARY COMPLETION™

A core idea within the structures and processes of organisms is understanding the hierarchical organization of systems within multicellular organisms. This item requires the examinee to classify the organizational level of a part of the human body (HS-LS1-2).

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Item 1

The parts of the human body can be classified into different levels of organization. The chart describes several of these levels within a human.

Level	Description
Organ system	An organ system is a group of organs that work together to perform a specific function or set of functions.
Organ	An organ is a group of tissues that perform a specific function or set of functions.
Tissue	A tissue is a group of cells of the same type that work together to perform a specific function.
Cell	A cell is the smallest functional unit of life. There are different types of cells, which may have different structures and perform different functions.

An important part of the human body is the heart. The heart is primarily made of muscle tissue and connective tissue. The heart's primary function is to pump blood. Blood helps transport nutrients and waste products within the body. Diseases that affect the heart are the leading cause of death worldwide.

Which level of organization would the heart be classified as?

A Organ system

B Organ

C Tissue

D Cell

Science

A core idea within heredity is understanding the role of DNA in the inheritance of traits. This item requires the examinee to identify that DNA contains coded instructions that cells use to make proteins, which help determine the inherited traits of an organism (HS-LS3-1).

Item 2

Which of these describes a role of DNA in a cell?

A DNA is the material that forms into the cell's membrane.

B DNA produces the energy needed for the cell's activities.

C DNA provides the information to make proteins for the cell.

D DNA is the building block for the other molecules in the cell.

A core idea within heredity is understanding how variation within a population can be predicted using mathematical patterns. This item requires the examinee to analyze the frequencies of different physical traits in a group of offspring to determine the genetic traits of the parents (HS-LS3-3).

Item 3

A certain plant species varies in the shape of its leaf edges. Some of the plants have wavy-edged leaves, and some of the plants have straight-edged leaves. In this plant species, the trait for leaf-edge shape is controlled by a single gene. The dominant allele is represented by L, and the recessive allele is represented by l.

Two plants with wavy-edged leaves are crossed with each other, producing 421 offspring plants. Of these, 298 offspring plants have wavy-edged leaves, and 123 offspring plants have straight-edged leaves.

What are the genotypes of the parent plants in this cross?

A Ll and ll

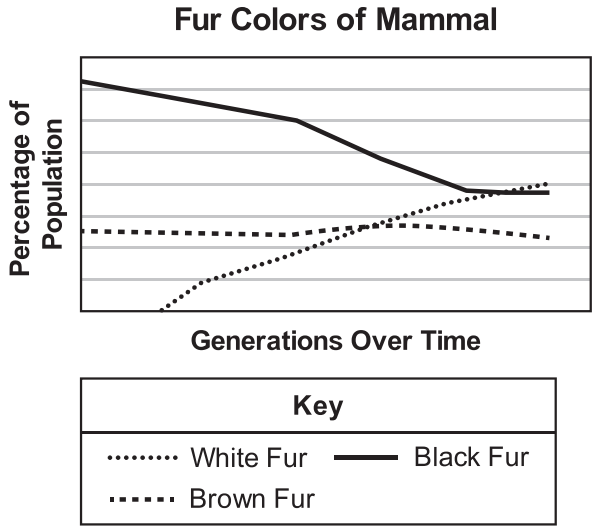
B Ll and Ll

C LL and ll

D LL and Ll

Use the following information to help answer questions 4-5.

A population of a certain species of mammal was studied over many generations. The graph shows the percentages of fur colors observed in the population over the generations.



A core idea within heredity is understanding the source of new genetic variation within a population. This item requires the examinee to determine which claim most likely explains the appearance of a new variety within a population (HS-LS3-2).

Item 4

Which explanation is the most likely reason for the appearance of individuals that have white fur?

A The mammals adapted to a change in climate by changing their fur color.

B The mammals chose a different food source that resulted in a new fur color.

C A mutation occurred in an individual's fur color gene and resulted in a new fur color.

D A new predator moved into the area which caused the individuals to change fur color.

A core idea within biological evolution is understanding how differences in rates of survival and reproduction of organisms with different traits leads to changes in a population over time through natural selection. This item requires the examinee to analyze the changes in the traits within a population over time, in order to support an explanation for the observed changes (HS-LS4-3).

Item 5

Which statement would most likely help explain the changes over time in the percentages of the fur colors within the population?

A The mammals with white fur had an advantage in producing offspring.

B The mammals with brown fur had an advantage in producing offspring.

C The mammals with white fur had a disadvantage in producing offspring.

D The mammals with brown fur had a disadvantage in producing offspring.

A core idea within the interaction of Earth's processes and human activities is understanding how technological solutions can reduce the impact of human activities on natural systems. This item requires the examinee to identify which solution would best reduce carbon dioxide emissions from human activities (HS-ESS3-4).

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Item 6

Carbon dioxide is a gas present in small amounts in Earth's atmosphere. Carbon dioxide is absorbed and released as part of natural cycles that involve ecosystems, the ocean, the atmosphere, and other systems on Earth. The amount of carbon dioxide in the atmosphere affects Earth's global temperature and climate.

The amount of carbon dioxide in the atmosphere is also affected by certain human activities. For example, when fossil fuels are burned, they release carbon dioxide. Fossil fuels include coal, oil, and natural gas. Fossil fuels are used primarily as energy sources for transportation and for producing electricity. Oil is refined into gasoline and other fuels burned by cars, trucks, buses, and airplanes. Most power plants burn coal or natural gas to produce electricity for cities and towns.

Many scientists are concerned because the amount of carbon dioxide in the atmosphere has been increasing over the last century. During this same time period, Earth's global temperature has also increased. These scientists are concerned that a continued increase in carbon dioxide may cause further changes in Earth's climate.

Which of these solutions would best help reduce the amount of carbon dioxide released into the atmosphere by human activities?

A using rechargeable batteries in small electrical devices

B finding more sources of fossil fuels to extract through drilling and mining

C manufacturing more vehicles, such as cars and trucks, for use in transportation

D using more alternative energy sources, such as solar and wind, to produce electricity

Science

A core idea within Earth's place in the universe is understanding how the sun produces energy that eventually reaches Earth. This item requires the examinee to identify how the sun produces its energy (HS-ESS1-1).

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Item 7

The sun produces tremendous amounts of energy. Some of that energy reaches Earth and affects Earth's systems.

Which statement explains how the sun produces this energy?

A The sun produces energy through fusion reactions in its core.

B The sun produces energy through radioactive decay in its core.

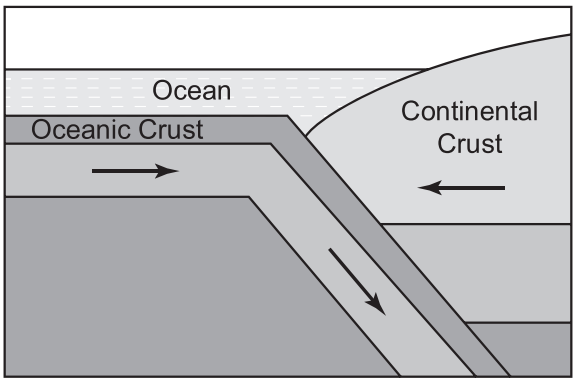
C The sun produces energy through convection cells on its surface.

D The sun produces energy through combustion reactions on its surface.

Science

Use the following information to help answer questions 8-9.

The diagram shows a cross-section of an area where two tectonic plates of Earth's surface are moving towards each other. The leading edge of one tectonic plate has oceanic crust, while the leading edge of the other tectonic plate has continental crust.



A core idea within Earth's systems is understanding how Earth's internal and surface processes create large-scale geographic features over time. This item requires the examinee to analyze a model of Earth's tectonic plates to predict the types of geographic features that would form over time (HS-ESS2-1).

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Item 8

Several types of geographic features would be predicted to form over time in the area shown in the diagram.

Which geographic feature would not be predicted to occur in this area?

A volcanoes

B mountains

C ocean ridge

D ocean trench

Science

A core idea within Earth's systems is understanding how Earth's surface processes are affected by Earth's internal processes. This item requires the examinee to explain that the motion of Earth's tectonic plates shown in a model is related to the cycling of material within Earth's interior (HS-ESS2-3).

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Item 9

Which of these could explain the motion of the tectonic plates shown in the diagram?

A rotation of Earth's axis

B currents within Earth's ocean

C convection of material within Earth's interior

D gravitational pull of the sun and moon on Earth's surface

Science

A core idea within forces and motion is understanding how scientific and engineering ideas are used to design devices that minimize the force acting on an object during a collision. This item requires the examinee to recognize a safety feature designed to reduce the force experienced during a car collision (HS-PS2-3).

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Item 10

When a moving object, such as a car, experiences a collision that causes the object to stop moving, the amount of force experienced by the object can be determined using the following formula:

$$Force \times change\ in\ time = mass \times change\ in\ velocity$$

During the collision, the object's velocity (speed) slows down over a period of time until the object stops, reaching a velocity of zero. If the force experienced by the object during the collision is too high, the force can damage the object. For example, the force of a collision can damage a car and injure passengers in the car.

One way to reduce the amount of force experienced during a collision is to reduce the velocity of the object before the collision occurs. An object that is moving slower will experience less force during a collision. An object that is moving faster will experience more force during a collision.

Another way to reduce the amount of force experienced during a collision is to increase the amount of time that it takes the velocity to slow down and reach zero. An object that comes to a stop more slowly will experience less force. An object that comes to a stop more quickly will experience more force.

Which of these is an example of a safety feature that reduces the amount of force experienced during a collision involving a car?

A A concrete barrier on a road helps prevents cars from driving into a ditch.

B An engine helps supply power to the wheels to increase the velocity of a car.

C A car windshield is constructed from reinforced layers to help prevent shattering.

D An air bag in a car helps increase the amount of time that a person takes to slow down.

Science

A core idea within forces and motion is understanding how Newton's second law of motion describes the mathematical relationship between the force acting on an object, the object's mass, and the object's acceleration. This item requires the examinee to analyze data to determine the acceleration of an object and then use Newton's second law to create an equation to calculate the amount of force that acted on the object (HS-PS2-1).

Item 11

An object at rest with a mass of 4 kilograms (kg) is acted on by a force causing the object to move. The table shows measurements of the object's motion.

Time (s)	Velocity (m/s)
0	0
1	2
2	4
3	6
4	8
5	10

The relationship between the force acting on an object and the object's mass and acceleration (change in object's velocity over time) is defined by the formula:

Force = mass × acceleration

Based on the data, which equation correctly calculates the amount of force, in newtons (N), that acted on the object?

A 4 kg × 0.5 s^2/m = 2 N

B 4 kg × 2 m/s^2 = 8 N

C 4 kg × 5 s = 20 N

D 4 kg × 10 m/s = 40 N

Use the following information to help answer questions 12-13.

Potassium chlorate ($KClO_3$) is a crystalline solid that can undergo thermal decomposition to form solid potassium chloride (KCl) and gaseous oxygen (O_2) when heat is added. The chemical equation for this reaction is shown.

$$2\ KClO_3 + \text{heat} \rightarrow 2\ KCl + 3\ O_2$$

The table lists the molar masses of the elements involved in this reaction.

Element	Symbol	Molar Mass (grams/mole)
Potassium	K	39.10
Chlorine	Cl	35.45
Oxygen	O	16.00

A core idea within matter and its interactions is understanding how the conservation of matter allows predictions of the amounts of reactants and products in a chemical reaction. This item requires the examinee to create a mathematical equation to predict the expected amount of a product in a chemical reaction (HS-PS1-7).

Item 12

If 5.00 grams of $KClO_3$ (0.0408 moles) undergoes decomposition to produce 3.04 grams of KCl, which equation shows the predicted amount of oxygen that will be produced?

A $0.0408 \text{ moles} \times \frac{2 \text{ moles}}{3 \text{ moles}} \times \frac{16.00 \text{ grams}}{\text{mole}} = 0.435 \text{ grams}$

B $0.0408 \text{ moles} \times \frac{2 \text{ moles}}{3 \text{ moles}} \times \frac{32.00 \text{ grams}}{\text{mole}} = 0.870 \text{ grams}$

C $0.0408 \text{ moles} \times \frac{3 \text{ moles}}{2 \text{ moles}} \times \frac{16.00 \text{ grams}}{\text{mole}} = 0.979 \text{ grams}$

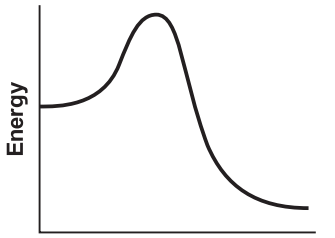
D $0.0408 \text{ moles} \times \frac{3 \text{ moles}}{2 \text{ moles}} \times \frac{32.00 \text{ grams}}{\text{mole}} = 1.96 \text{ grams}$

A core idea within matter and its interactions is understanding that the release or absorption of energy during a chemical reaction is related to the changes in the energy of the materials. This item requires the examinee to recognize heat energy is absorbed during this chemical reaction and to select the model that best represents the changes in energy during the reaction (HS-PS1-4).

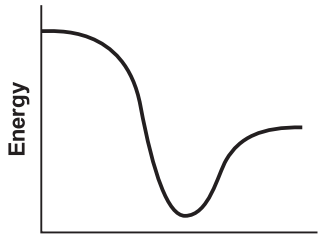
Item 13

Which diagram best represents the change in energy that results from the decomposition reaction of potassium chlorate?

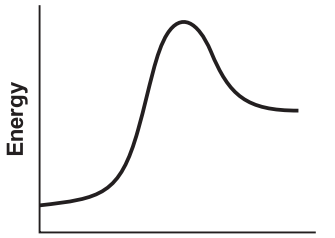
A



C



B



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