The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

EARTH AND SPACE SCIENCES

Friday, January 23, 2026 — 9:15 a.m. to 12:15 p.m., only

Student Name _____

School Name _____

The possession or use of any communications device is strictly prohibited when taking this examination. If you have or use any communications device, no matter how briefly, your examination will be invalidated and no score will be calculated for you.

Print your name and the name of your school on the lines above.

Use your knowledge of **Earth and Space Sciences** to answer all questions in this examination. Before you begin this examination, you must be provided with the ***2024 Edition Reference Tables for Earth and Space Sciences***. You may need to use these reference tables to answer some of the questions.

You are to answer all questions in this examination. You may use scrap paper to work out the answers to the questions, but be sure to record your answers on your answer sheet and in your test booklet. A separate answer sheet for multiple-choice questions has been provided to you. Follow the instructions from the proctor for completing the student information on your answer sheet. Record your answers for the constructed-response questions in your test booklet.

All answers in your test booklet should be written in pen, except for graphs and drawings, which should be done in pencil.

When you have completed the examination, you must sign the declaration printed on your separate answer sheet, indicating that you had no unlawful knowledge of the questions or answers prior to the examination and that you have neither given nor received assistance in answering any of the questions during the examination. Your answer sheet and test booklet cannot be accepted if you fail to sign this declaration.

NOTICE …

A four-function or scientific calculator and a copy of the ***2024 Edition Reference Tables for Earth and Space Sciences*** must be available for you to use while taking this examination.

Note that diagrams are not drawn to scale unless otherwise noted.

DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

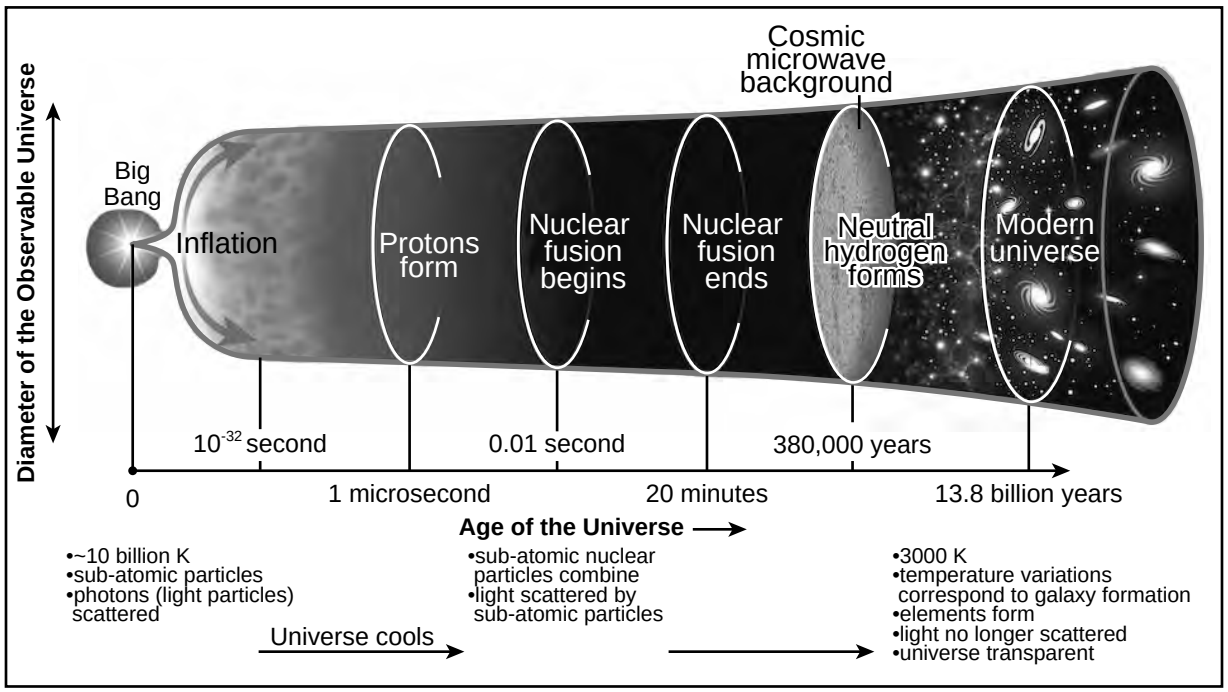
Base your answers to questions 1 through 5 on the information below and on your knowledge of Earth and Space Sciences. Some questions may require the use of the ***2024 Edition Reference Tables for Earth and Space Sciences***. Be sure to record your answers for multiple-choice questions on the separate answer sheet provided. Record your answers for constructed-response questions in your test booklet.

Evidence for the Big Bang Theory

The Big Bang is a physical theory that describes how the universe expanded from an initial state of high density and high temperature. The theory attempts to explain how the universe has changed over time. Three pieces of evidence are used to support this theory. The measured amounts of elements in the universe supports this theory. The observed expansion of space that is accelerating is another piece of evidence. Also, the discovery of cosmic microwave background radiation (CMBR) supports the theory.

The model below shows some information about how the universe has changed since the Big Bang event. Temperatures in the model are in Kelvin (K).

Evolution of the Universe Since the Big Bang Model



1 Complete each of the three statements below to correctly describe cosmic microwave background radiation by placing an **X** in the box to indicate which phrase correctly completes each statement. [1]

Statement 1:

Cosmic microwave background radiation provides evidence of the Big Bang because it is

☐ energy, predicted by scientists, that is distributed throughout the universe

☐ matter, predicted by scientists, that has fused to become elements

Statement 2:

Cosmic microwave background radiation is able to be detected because the universe

☐ rapidly expanded due to extreme heat

☐ cooled and then became transparent

Statement 3:

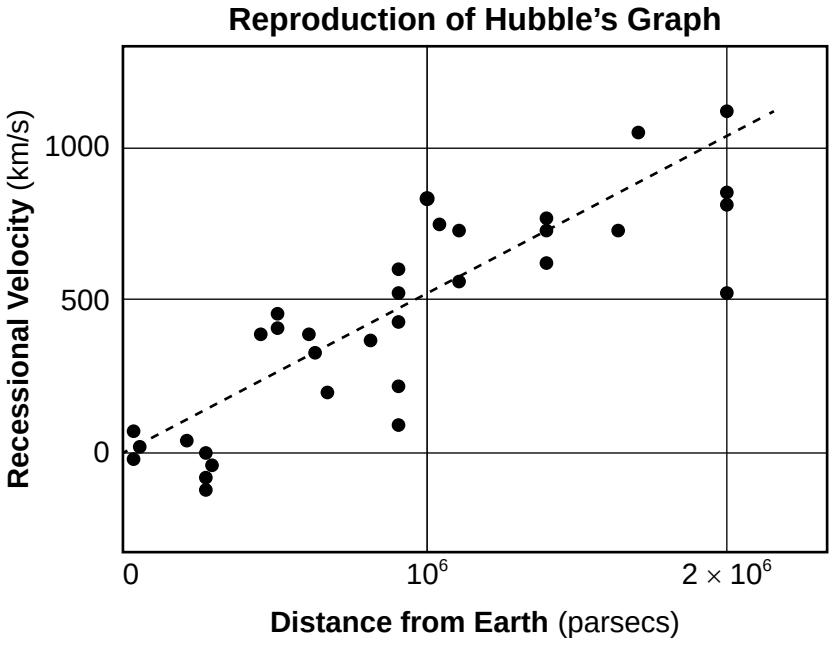
Cosmic microwave background radiation variations in the universe, caused by density differences, indicate that

☐ galaxies formed in areas of higher density

☐ galaxies formed in areas of lower density

In the 1920s, astronomer Edwin Hubble studied galaxies using a type of star called a Cepheid variable. These types of stars brighten and fade in a predictable pattern. Hubble observed these stars to determine how far away these stars, and the galaxy in which they are located, are from Earth.

A reproduction of Hubble's 1929 graph is shown. Recessional velocity of a galaxy (speed relative to Earth) is plotted as a function of distance from Earth to the galaxy. It is measured in parsecs (1 parsec = 3.26 light years). Galaxies traveling toward Earth have negative recessional velocities.



Several statements about Hubble's work related to galaxies are listed below.

Statement 1: Hubble's graph shows that there is no relationship between the distance of a galaxy from Earth and the galaxy's recessional velocity.

Statement 2: The evidence for speeds of most galaxies on Hubble's graph was most likely obtained from red-shift data for each galaxy.

Statement 3: Galaxies measured by Hubble that were 2×10^6 parsecs away from Earth all have a recessional velocity greater than 500 km/s.

Statement 4: Hubble's graph shows a proportional relationship between distance of a galaxy from Earth and the galaxy's recessional velocity.

Statement 5: Some galaxies shown on Hubble's graph are traveling slower as they get farther from Earth.

Statement 6: The evidence for speeds of most galaxies on Hubble's graph was most likely obtained from blue-shift data of each galaxy.

2 Which statements correctly summarize Hubble's data as evidence to support the Big Bang Theory?

(1) Statements 1, 5, 6
(2) Statements 2, 3, 4
(3) Statements 3, 1, 6
(4) Statements 4, 2, 5

3 How does the data in the graph support an explanation of the Big Bang theory?

(1) Galaxies farther from Earth have greater recessional velocities, indicating an expanding universe.
(2) Galaxies closer to Earth have negative recessional velocities, indicating that the rate of the expansion of the universe only occurs around distant galaxies.
(3) Galaxies located approximately one million (10^6) parsecs away from Earth are traveling toward and away from Earth, indicating that the universe does not expand further than this distance.
(4) Galaxies travel away from Earth at constant velocities, indicating that the universe is expanding at a constant rate.

The table below shows some information about two stars in the Milky Way galaxy.

Stars	**Elements Composing Star**	**Mass** (kg)
Betelgeuse	Helium, carbon, oxygen, neon, magnesium, sodium, iron	3.28×10^{31}
The Sun	Hydrogen, helium	1.99×10^{30}

4 Which statement correctly explains the difference in the elements composing the two stars and compares the lifespans of these two stars?

(1) In Betelgeuse, helium has fused into heavier elements, and Betelgeuse has a shorter lifespan than the Sun.

(2) In Betelgeuse, hydrogen has yet to be fused from heavier elements, and Betelgeuse has a longer lifespan than the Sun.

(3) In the Sun, heavier elements have completely fused into helium, and the Sun has a shorter lifespan than Betelgeuse.

(4) In the Sun, hydrogen has yet to be fused from heavier elements, and the Sun has a longer lifespan than Betelgeuse.

5 Explain how the masses of Betelgeuse and the Sun are a factor in the rate of nucleosynthesis being different for each star. [1]

Base your answers to questions 6 through 9 on the information below and on your knowledge of Earth and Space Sciences. Some questions may require the use of the ***2024 Edition Reference Tables for Earth and Space Sciences***.

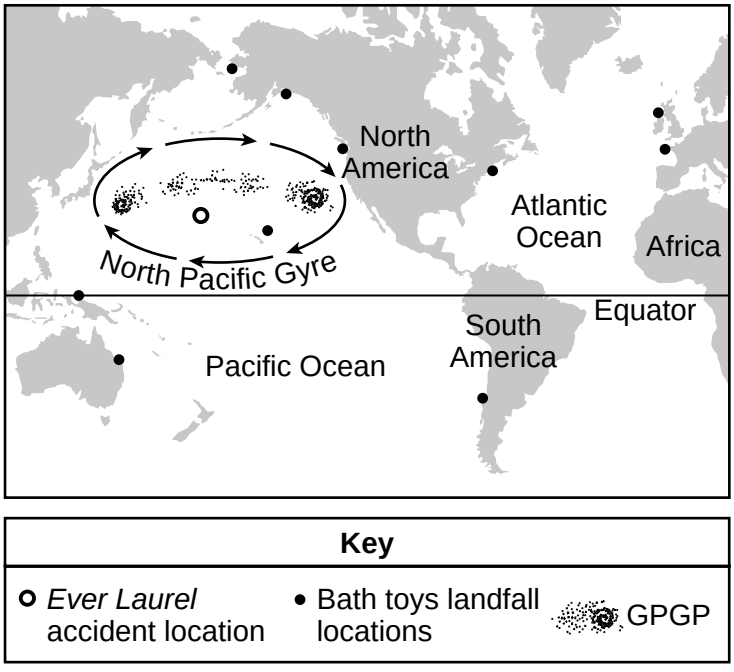
Rubber Ducks and Pacific Ocean Trash

On January 10, 1992, the container ship, *Ever Laurel*, lost twelve 40-foot containers during a storm at sea. One container broke open and released over 28,000 plastic bath toys into the ocean. These bath toys floated on the ocean surface for years and made landfall on beaches worldwide.

The Pacific Ocean is home to the Great Pacific Garbage Patch (GPGP). This island of plastic is 1.6 million square km in size—approximately 11-times the size of New York State. Garbage patches are found worldwide within ocean gyres where water conditions are calm. Scientists have been studying the sizes, compositions, and ages of the plastic pieces in the patch to determine the origin of the plastic in order to mitigate the problem of increasing plastic pollution in ocean ecosystems.

The map below contains some information about the *Ever Laurel* accident, locations where bath toys were found, and the Great Pacific Garbage Patch.

Map of the *Ever Laurel* Accident



6 Complete each of the three statements below by placing an **X** to correctly describe the factor responsible for global atmospheric and oceanic circulation patterns that distributed the bath toys to various locations on Earth. [1]

Statement 1:

Evidence for the distribution pattern of the plastic bath toys from the accident location to the northwest coast of North America is provided by

☐ the movement of the toys along the Kuroshio Current, followed by movement along the California Current

☐ the movement of the toys along the North Pacific Current, followed by movement along the Alaska Current

Statement 2:

One cause of the global circulation patterns of ocean currents is the

☐ location and distribution of landmasses

☐ distance from the equator

Statement 3:

Other than ocean currents, global patterns that contributed to the distribution of the toys were also influenced by atmospheric

☐ concentrations of greenhouse gases

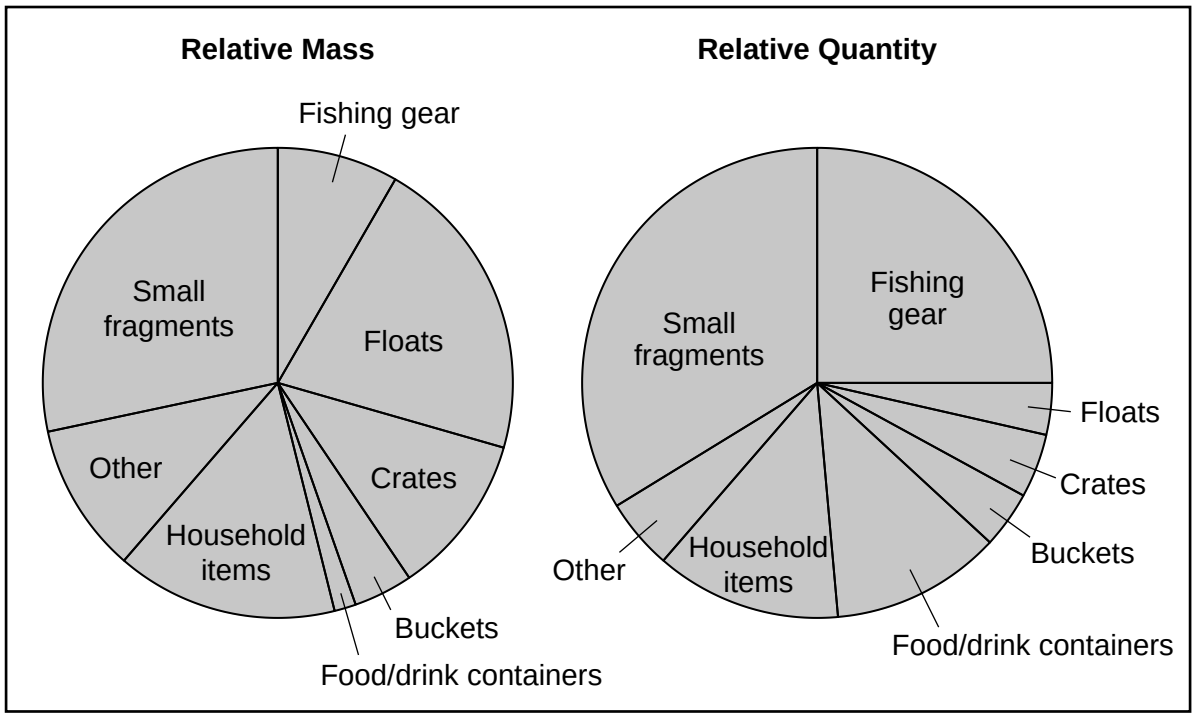
☐ density and heat energy differences

7 Other than ocean currents, what other factor determines the global circulation of these plastic toys?

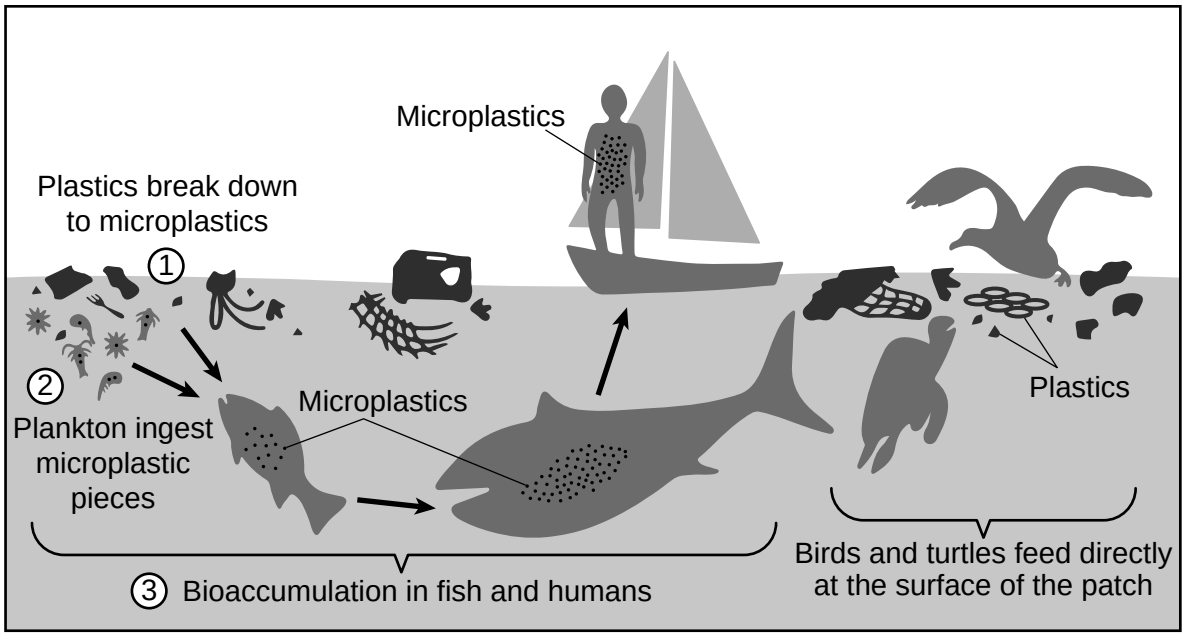
(1) stratosphere convection
(2) prevailing winds
(3) elevation
(4) cloud cover

Many types of plastic are found in Earth's oceans. The pie charts and infographic below show some information about plastic in Earth's oceans. Arrows in the infographic represent the transfer of plastics through different organisms.

Plastic Sources Found in the GPGP Greater Than 5 cm



Transfer of Plastics in the GPGP Through Marine Food Chain to Humans



Sea turtles in the GPGP often feed on plastic bags and plastic sheets. This is because the turtles mistake the plastic for their common prey, jellyfish.

8 Which statement explains how the removal of plastic bags in the GPGP will stabilize biodiversity in the area?

(1) Decreasing the number of bags in the GPGP will cause the jellyfish population to increase because the turtles will eat more plastic bags.

(2) Decreasing the number of bags in the GPGP will cause the turtle population to increase because the turtles will eat more jellyfish.

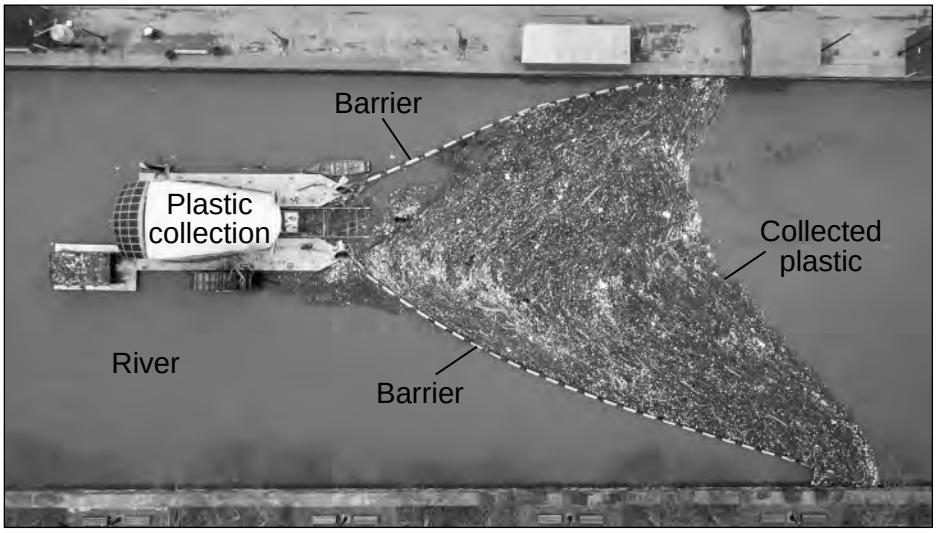
(3) Decreasing the number of bags in the GPGP will cause the jellyfish population to decrease because the turtles will eat less jellyfish.

(4) Decreasing the number of bags in the GPGP will cause the turtle population to decrease because the turtles will eat less jellyfish.

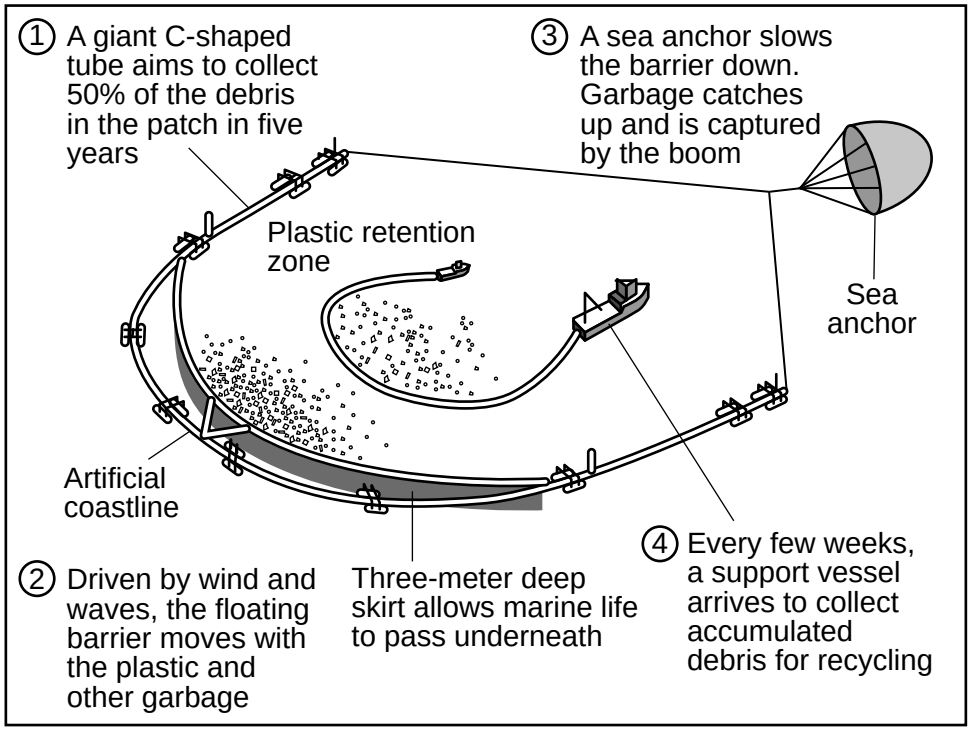
Many organizations and governmental bodies have investigated methods to address the growing problem of plastic pollution. These methods include reducing the use of plastics, recycling plastics, and participating in waterway cleanups.

More complex solutions are being used to clean up rivers and oceans. In rivers, barriers at the mouth of the river funnel the plastic into a collection area where the plastic is manually removed and hauled away to be recycled. In oceans, scientists use a device to collect floating plastic and bring it back to shore for recycling. The photograph and model below show some information about these two removal methods.

River Removal Method



Model of Ocean Removal Method



The chart below shows some information about the methods for removing plastics from water.

Pros and Cons of Plastic Removal Methods

	Pros	Cons
River	• Floats and allows for changing water level • Locally constructed, lower cost • Good results of capturing surface plastics • Capture occurs before it enters the ocean	• Collected plastics need to be removed manually • Reduced capture rates during low water flow • Not effective for microplastics (<1 mm) or deep plastics • Barrier may impact biodiversity
Ocean	• Effective in removing large volumes of plastic over a large area • Private organizations perform work • Any unpleasant sight or odor is in the ocean and not impacting a community • Could save energy	• Does not capture microplastics (<1 mm) or deep plastics • High maintenance cost and frequent downtime as a result of breaking of equipment • Impacts surface aquatic life to a depth of five meters • Secondary vessel needs to remove collected plastics every few weeks

9 A student makes a claim that the river cleanup method is a more effective design solution than the ocean cleanup method for reducing the impact of plastic pollution. Using all the information provided, which statement provides the most correct evidence to support this claim?

(1) The river method costs less than the ocean method and captures plastic before it enters the ocean, protecting river and ocean coastline biodiversity.

(2) The river method can collect plastic over a larger area and has lower maintenance costs than the ocean method.

(3) The river method is able to capture plastics of all sizes that are both floating and underwater, while the ocean method only collects large plastic pieces.

(4) The river method captures more plastic than the ocean method because more plastics are found in the ocean than in the rivers.

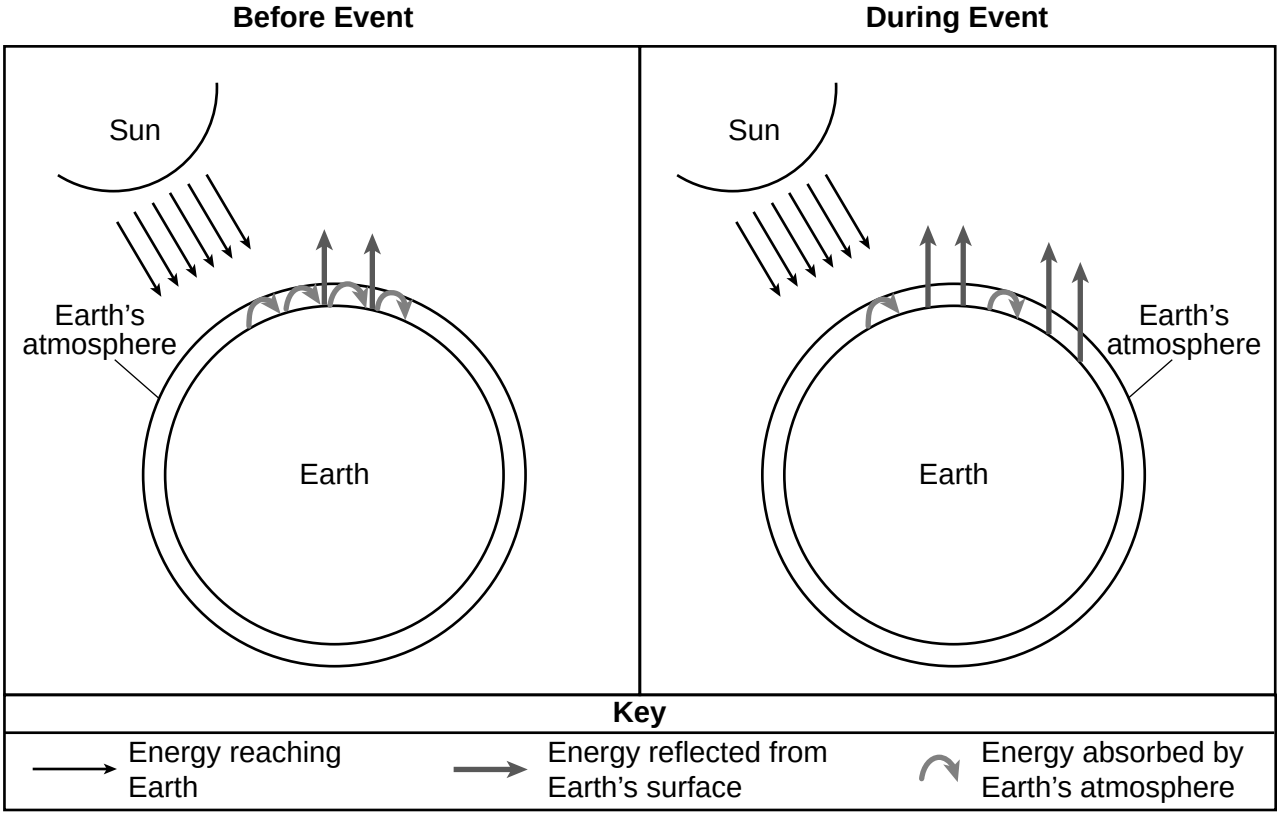
Base your answers to questions 10 through 13 on the information below and on your knowledge of Earth and Space Sciences. Some questions may require the use of the ***2024 Edition Reference Tables for Earth and Space Sciences***.

Evolution of Early Earth Systems

Around 2.7 Ga (billion years ago) microbes called cyanobacteria (that formed stromatolites) evolved in oceans. These microbes performed photosynthesis. They had the ability to use water as a "fuel" to make oxygen. This oxygen was released into the seawater. Its level gradually increased over a span of about 200 to 300 million years. Eventually, it escaped into the atmosphere where it reacted with methane. This reaction caused methane levels to decrease and oxygen levels to increase. This occurred about 2.4 to 2.1 Ga. This increase in atmospheric oxygen is called the Great Oxidation Event. These oxygen-level changes on Earth indirectly led to climate change.

The models below represent the relative amounts of different types of energy reaching Earth, reflected from Earth, and absorbed by Earth's atmosphere during two different time periods.

Models of Great Oxidation Events



10 Which row in the table below correctly describes the evidence for the coevolution of Earth systems as a result of the Great Oxidation Event?

Row	Change to Atmospheric Gas	Response to Change	Effect on Climate
(1)	Methane level decreased; oxygen level increased	Less energy absorbed by atmosphere	Led to earliest ice age due to increased reflection of energy
(2)	Methane level increased; oxygen level decreased	More energy absorbed by atmosphere	Led to earliest ice age due to decreased reflection of energy
(3)	Methane level increased; oxygen level decreased	Less energy absorbed by atmosphere	Led to earliest ice age due to increased reflection of energy
(4)	Methane level decreased; oxygen level increased	More energy absorbed by atmosphere	Led to earliest ice age due to decreased reflection of energy

The Huronian ice ages were three separate glacial events that occurred between 2.4 to 2.1 Ga. These were among the earliest ice ages of Earth's geologic history. The planet's surface was almost entirely frozen at this time.

The Huronian Supergroup is a group of geologic formations, 12-kilometers thick. These formations provide evidence of the first major glacial episode. The age of these formations was determined using the ratio of uranium to lead isotopes in rocks. This supergroup formed when this ice-covered landmass was closer to the equator than it is now when the ice reached to sea level.

The Huronian Supergroup is typical of deposits in a marine environment. It consists of sedimentary rock that includes dropstones (embedded volcanic and/or sedimentary fragments). Dropstones are evidence for glacial ice ages because glaciers carry different-sized sediments in the ice. Glaciers then drop these rocks at sea. They become embedded in marine sediments that eventually form sedimentary rock.

11 Which statement identifies the evidence used to determine when the Huronian ice age occurred?

(1) Radioactive dating of elements in rocks was used to determine ages of rocks in the Huronian Supergroup.

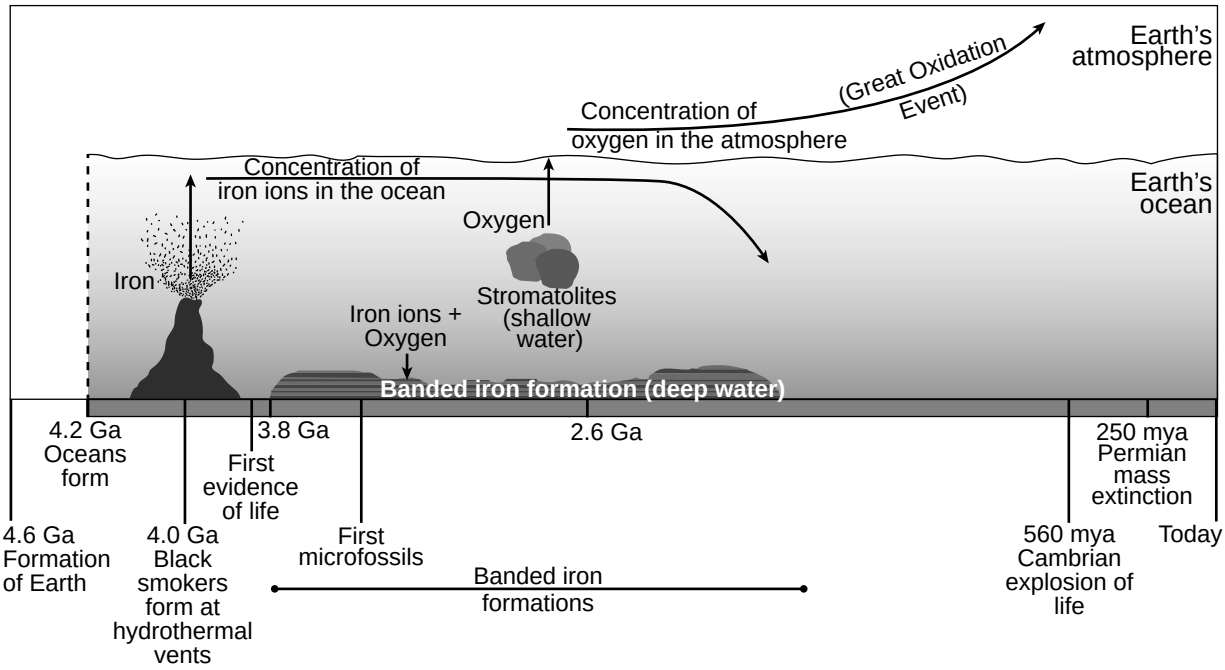
(2) Index fossils were identified in the Huronian Supergroup to determine the ages of rocks.

(3) Rocks in the Huronian Supergroup were carbon dated to determine their age.

(4) The ages of the dropstones in the sedimentary rock are younger than the particles that make up the rock itself.

Among the oldest rocks on Earth are sedimentary rocks known as banded iron formations. These rocks formed in oceans containing some of Earth's first available free oxygen. The model below shows some information about Earth's early ocean and atmosphere. All geologic times are approximate. Billion years ago is represented by Ga and million years ago is represented by mya.

Model of Earth's Early Ocean and Atmosphere



12 Which statement correctly uses information from the model and passages as evidence to support the claim that, during the end of the Huronian ice age, changes in Earth's hydrosphere caused a change in Earth's geosphere?

(1) Microfossils found in the banded iron formations produced the iron in the oceans.

(2) Iron in the ocean was used for energy by the photosynthesizing stromatolites in the shallow part of the ocean.

(3) The presence of carbon dioxide and methane in the ocean led to the formation of black smokers on the bedrock of the ocean bottom.

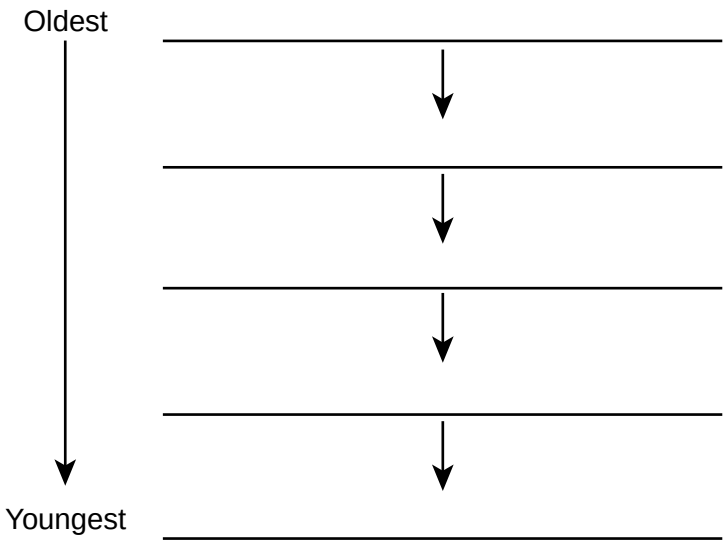
(4) The presence of iron and oxygen in the oceans led to the formation of banded iron rock layers on the bottom of the ocean.

13 Earth's surface processes cause changes to Earth's surface and atmosphere. Past changes produced conditions that led to future events.

Using the information provided in the model, place the list of events below in the correct temporal sequence to complete the graphic organizer. [1]

Events

- First oceans form
- The Great Oxidation Event
- First appearance of banded iron formations
- Iron enters the ocean from black smokers
- Formation of Earth



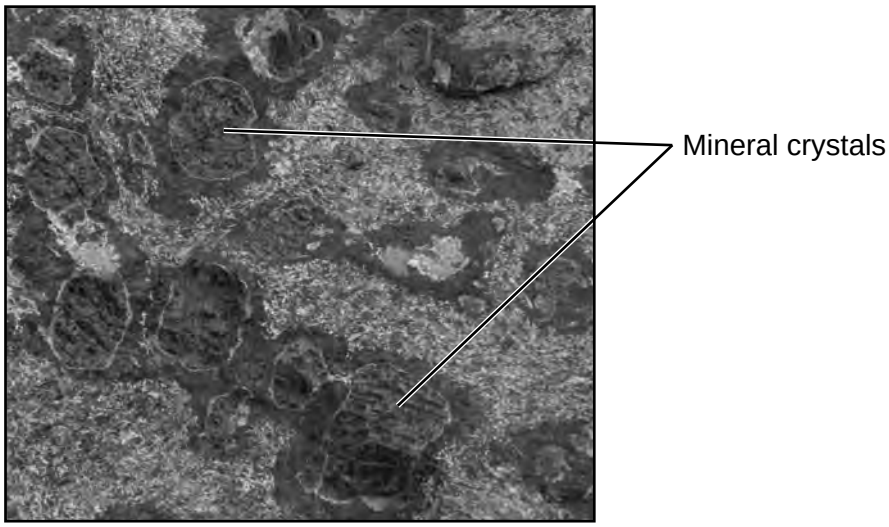
Base your answers to questions 14 through 18 on the information below and on your knowledge of Earth and Space Sciences. Some questions may require the use of the ***2024 Edition Reference Tables for Earth and Space Sciences***.

Mined and Mineral Resources of New York State

A class was investigating mined and mineral resources in New York State. On a trip to the Adirondacks, the teacher told the students that the mineral crystals embedded in many rocks found in the Adirondacks were actually the New York State mineral. This mineral was an important source of abrasives.

A student found several of these rocks on the trip. They recorded observations about the physical properties in order to try to identify these large minerals embedded in the rock. They took a photograph of the rock, which is shown below, and listed observations, which are shown on the next page.

Adirondack Rock with Mineral Crystals



Observations:

A. The mineral inclusions are dark red in color and glassy-looking.

B. The mineral crystals are embedded in a rock with several dark and light minerals mixed together.

C. The mineral crystals are able to scratch glass and have a colorless streak.

D. The rock was found at a high elevation.

E. The mineral crystals in the rock broke into uneven pieces with sharp edges.

F. The rocks containing these minerals were very dense.

14 Based on the student's observations, which set of observations and mineral name correctly identifies the mineral crystals in the photograph?

(1) Observations *A*, *B*, and *C* identify magnetite.

(2) Observations *D*, *E*, and *F* identify olivine.

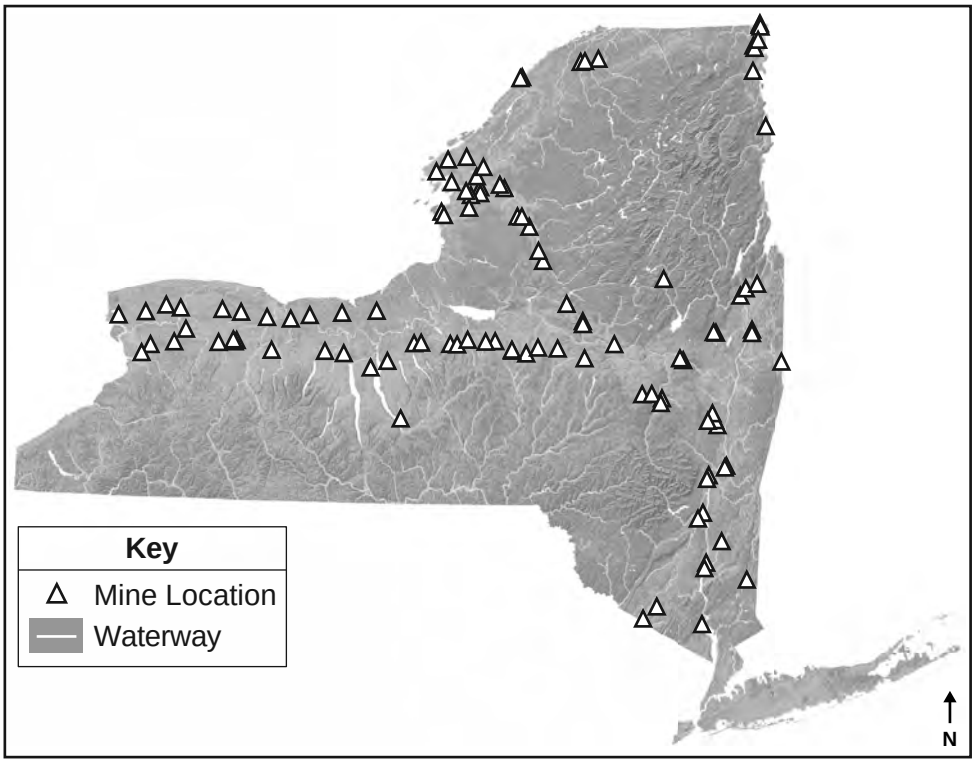
(3) Observations *A*, *C*, and *E* identify garnet.

(4) Observations *B*, *D*, and *F* identify hematite.

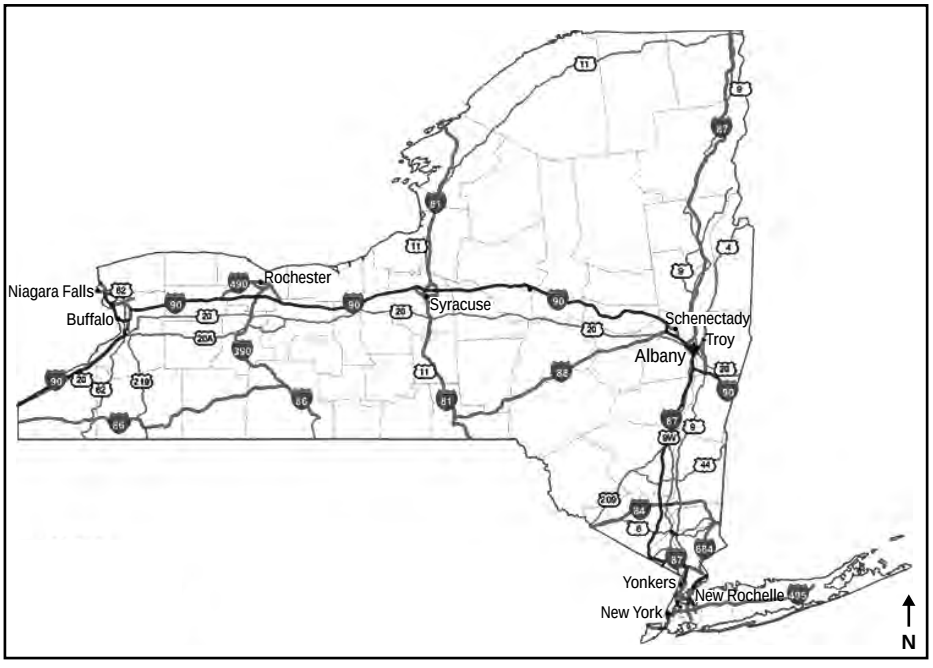
Limestone and dolostone mines comprise the third largest number of mines in New York State. These rocks are primarily used as crushed stone in the construction industry.

The maps below show some information about mines and major highways in New York State.

Limestone and Dolostone Mines 2020



Major Highways in New York State



15 Using evidence from the maps, construct an explanation that describes how a human activity may have been affected by the availability of limestone and dolostone in New York State. [1]

Mines in New York State must be "reclaimed" when the mine is no longer in operation. This means the environmental effects of the mine must be reversed by returning the land to an ecological or economically usable condition.

The photographs below show two stages of reclamation of the Woodbourne Flats Mine in Sullivan County, New York. *Photograph 1* shows a portion of the Neversink River with 600 newly planted indigenous black willow trees. *Photograph 2* shows a human-made, 35-acre pond. It is surrounded by planted vegetation natural to that area.

Photograph 1

Photograph 2

16 Write the correct letters from the choices below on the line at the end of each sentence to complete each statement about the reclamation of the Woodbourne Flats Mine. [1]

Choices for Statement 1:

A– stabilize river banks and reduce deposition of sediment along the river banks

B– stabilize river banks and reduce the impact of flooding events

Choices for Statement 2:

C– capture sediment-laden storm water to be used as a source for drinking water in a nearby housing complex

D– capture runoff from the surrounding area and reduce the amount of sediment released into the nearby river

Choices for Statement 3:

E– stabilize slopes and restore habitat of the original ecosystem

F– stabilize slopes and introduce non-native plants to the original ecosystem

Statement 1: The planting of the black willow trees will _____.

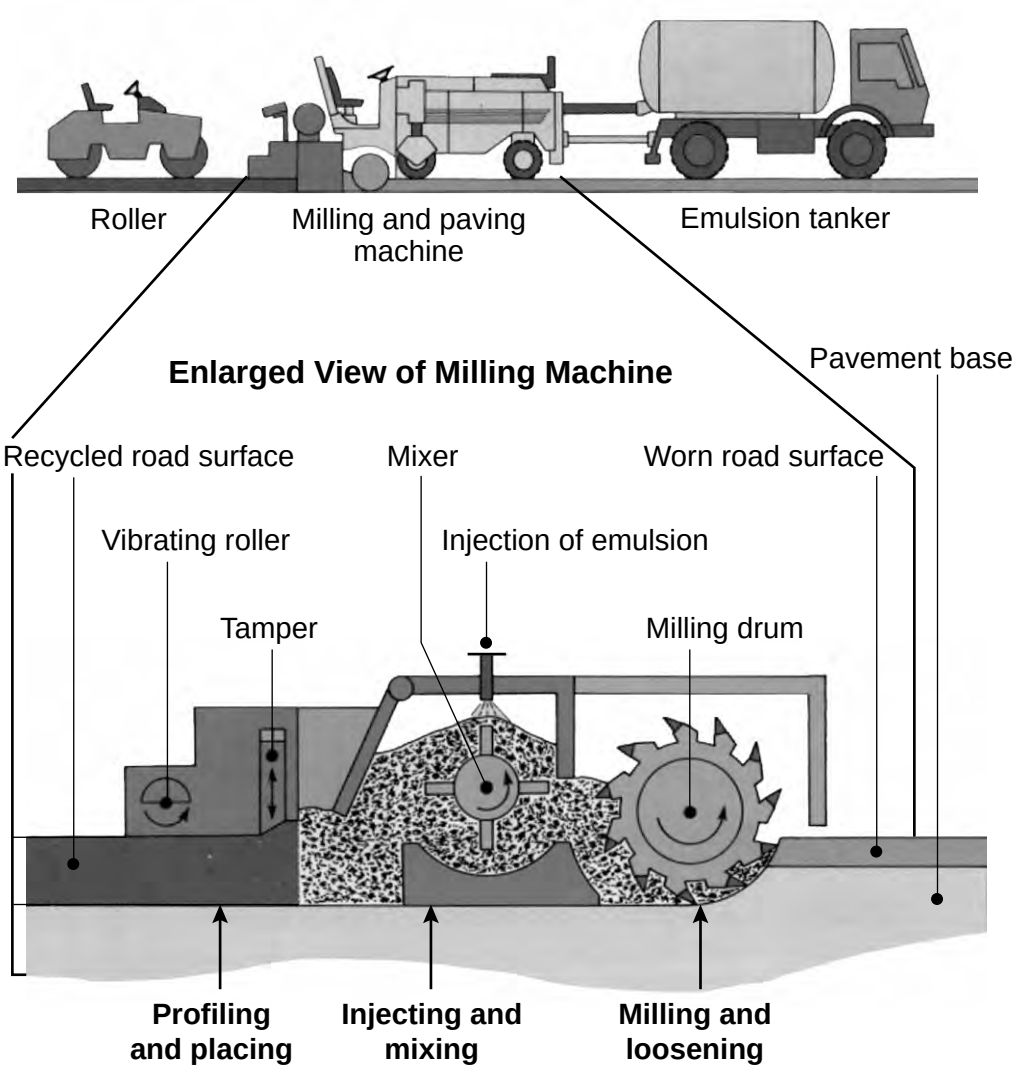
Statement 2: The creation of the 35-acre pond will _____.

Statement 3: The planting of vegetation around the pond will _____.

Paved road surfaces are typically constructed from a mixture of aggregates (sand, gravel, and crushed stone). It is held together by an emulsifier. An emulsifier is a sticky, tar-like substance made from petroleum. Historically, natural sources (quarried stone) were used for road construction. A newer method of road resurfacing, called recycled asphalt pavement (RAP), has been used on road resurfacing projects. Some differences between these two resurfacing methods are described in the table below. The model shows the equipment used on a RAP resurfacing project.

	Natural Paving Materials	Recycled Asphalt Pavement
Aggregate Source	Quarry rock is blasted from Earth's surface and hauled by truck to a processing plant.	Milling machines grind existing road surfaces for use on-site.
Aggregate Processing	Stone is crushed, sorted, and dried before being mixed with 3 to 7% emulsifier.	Millings are mixed with 1 to 3% emulsifier.
Materials Transport	Natural paving materials are taken by truck from the quarry to the site, often several miles away.	Milled material does not require transportation to the site of road resurfacing.
Mining Impacts	Quarried stone is taken from surface mines that will require reclamation.	Recycled material does not have to be mined and reclamation is not required.

Recycled Asphalt Paving (RAP) Model



17 Which statement below correctly identifies a benefit to a local community when comparing these two design solutions for resurfacing roads?

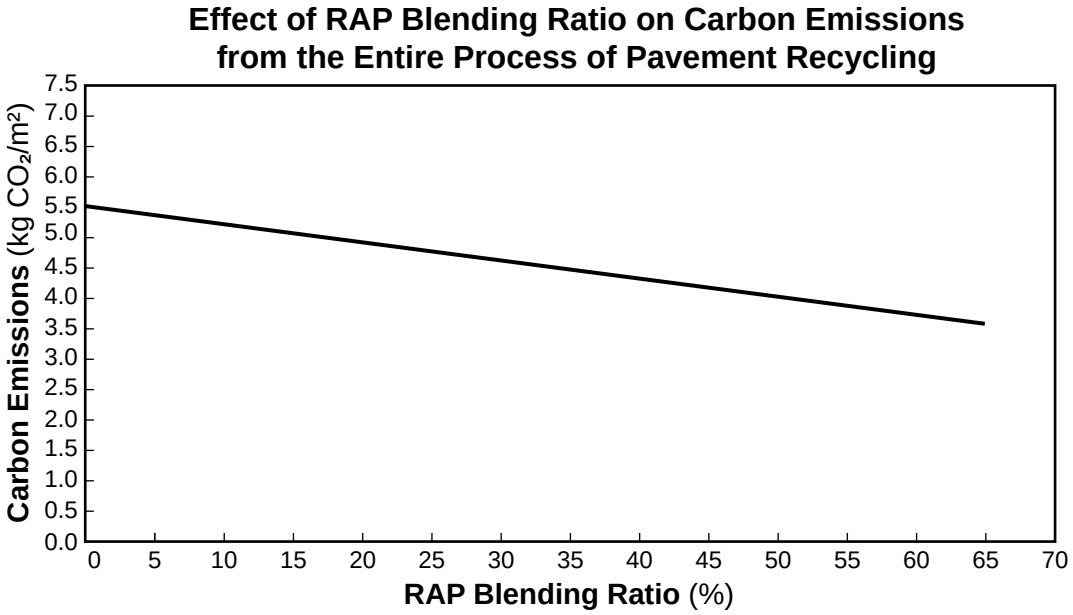
(1) Local quarries supplying natural paving materials will use more fuel for trucking and processing.

(2) Recycled asphalt pavement will use more petroleum products in the form of fuel and emulsifier.

(3) Recycled asphalt pavement does not require reclamation and will extend the life span of existing quarries.

(4) Blasting, crushing, and processing costs are higher with recycled asphalt pavement.

Natural material is sometimes blended with RAP at the asphalt plant. The percentage of RAP mixed with natural material is called blending ratio. The graph below shows some information about pavement recycling.



18 Which row in the table below correctly identifies how the use of RAP in the paving of roadways influences the CO_2 levels in the atmosphere and how it impacts climate?

Row	RAP Blending Ratio (%)	Carbon Emissions (kg CO_2/m^2)	Impact on Climate
(1)	Increase	Increase	Increased global warming
(2)	Decrease	Increase	Decreased global warming
(3)	Increase	Decrease	Decreased global warming
(4)	Decrease	Decrease	Increased global warming

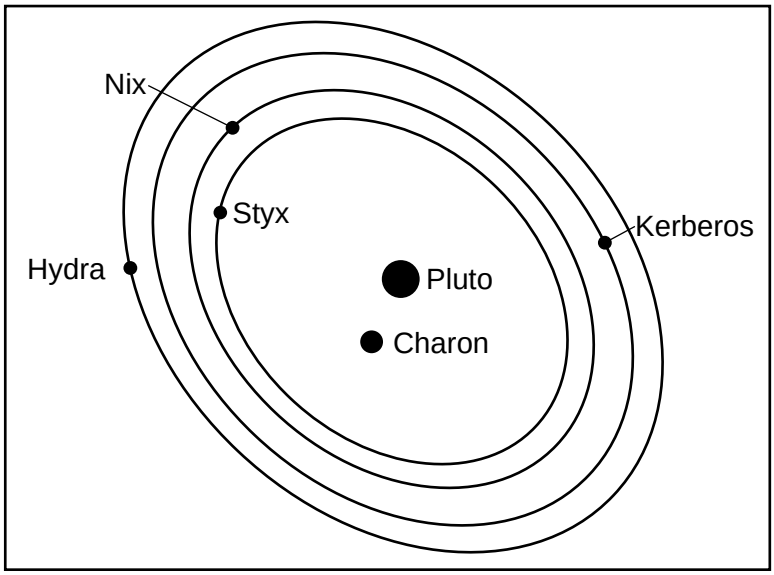
Base your answers to questions 19 through 23 on the information below and on your knowledge of Earth and Space Sciences. Some questions may require the use of the ***2024 Edition Reference Tables for Earth and Space Sciences***.

The Moons of Pluto

In addition to the eight planets, our solar system consists of other celestial objects, including dwarf planets. Discovered in 1930, Pluto is one of the largest dwarf planets in our solar system. Pluto has five moons, the largest being Charon. Charon is about half the size of Pluto, leading some scientists to refer to these celestial bodies as a double dwarf planet system.

The model below shows some information about the Pluto-Charon binary system. The orbit of Charon around Pluto is not shown.

Model of Orbits of Pluto's Moons – July 7, 2012



Pluto's Moons

Name of Moon	Average Orbiting Distance (km)	Eccentricity
Charon	19,640	0.0022
Hydra	64,738	0.0059
Kerberos	57,783	0.0033
Nix	48,694	0.0020
Styx	42,656	0.0058

19 Using the model and data table, complete the *List of Moons* below to rank the moons in order of increasing orbital period around Pluto. Justify your response using one of Kepler's laws. [1]

List of Moons

_____ Shortest orbital period

_____

_____

_____

_____ Longest orbital period

Justification: _____

_____

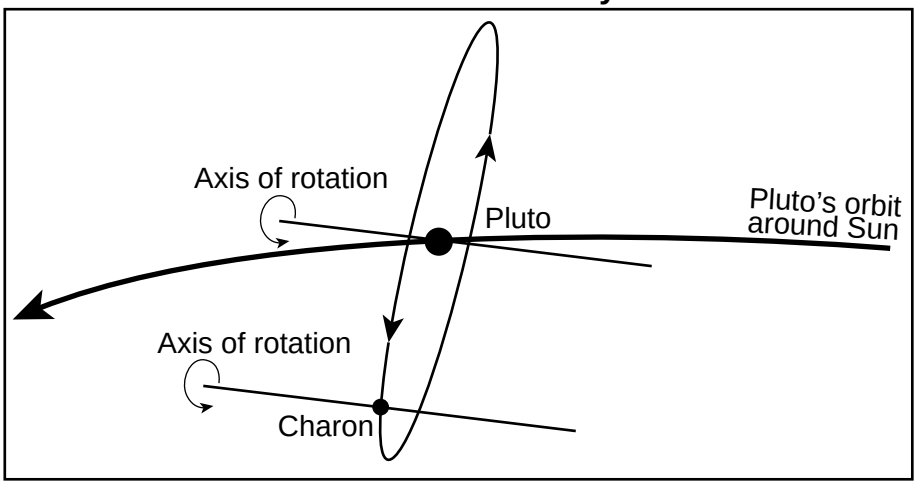
_____

20 Based on the information in the *Pluto's Moons* data table, which row in the table below correctly describes the orbital speed of Styx and the gravitational force of attraction exerted on Styx by Pluto as it orbits Pluto?

Row	Orbital Speed	Gravitational Force
(1)	Constant	Constant
(2)	Not constant	Constant
(3)	Constant	Not constant
(4)	Not constant	Not constant

The model below shows some information about Pluto's orbit around the Sun and Charon's orbit around Pluto.

Model of Pluto-Charon System



The data table below shows some information about Pluto and Charon.

Celestial Body	**Diameter** (km)	**Rotational Period** (Earth days)	**Orbital Period** (Earth days)
Pluto	2377	6.4	90,560
Charon	1214	6.4	6.4

21 Which pieces of evidence shown in the model and data table support the claim that the phases of Charon as viewed from Pluto change cyclically?

(1) Pluto orbits the Sun every 90,560 Earth days.

(2) Charon orbits the Sun every 90,560 Earth days.

(3) Charon orbits Pluto every 6.4 Earth days.

(4) Charon orbits the Sun every 6.4 Earth days.

22 A student makes the following claim:

The same side of Charon always faces Pluto to an observer on Pluto, just like the same side of the Moon always faces Earth to an observer on Earth.

Place a check mark (✓) in either the Support or Refute box below to indicate if the given information supports or refutes the student's claim. Justify your response using evidence from the information provided. [1]

☐ Support

☐ Refute

Justification: _____

_____

_____

Charon was first discovered in 1978 at the U.S. Naval Observatory. The four smaller moons were discovered between the years 2005 and 2012 using the Hubble Space Telescope. Some researchers have suggested that all five moons could be debris from the impact of an object with Pluto. Others theorize that the four smaller moons were created from an impact with Charon.

Photo of Pluto

Enlarged Photo of Charon

23 Which statement would provide evidence for the formation of Pluto's four smallest moons from a possible impact with Pluto or Charon?

(1) Pluto's surface is coated with methane ice.

(2) Craters with diameters as large as 240 kilometers exist on Charon's surface.

(3) The four smallest moons spin more rapidly on their axes than Pluto or Charon.

(4) Both Pluto and Charon have ice volcanoes created from the buckling of subsurface ice.

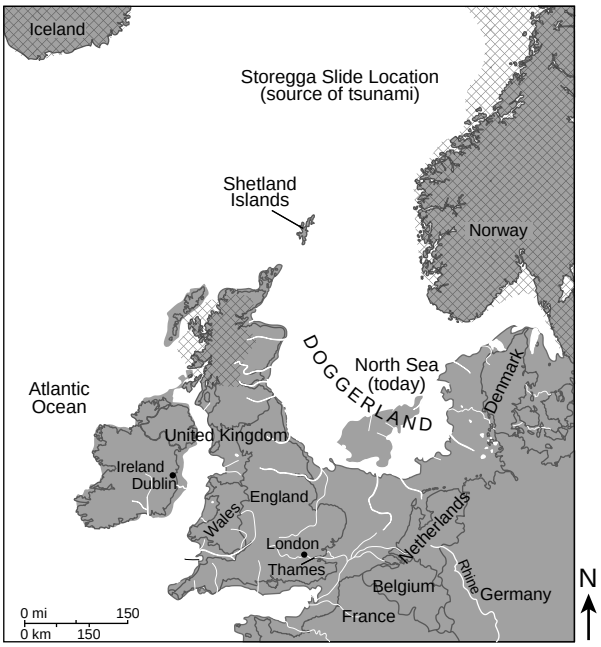
Base your answers to questions 24 through 27 on the information below and on your knowledge of Earth and Space Sciences. Some questions may require the use of the ***2024 Edition Reference Tables for Earth and Space Sciences***.

Doggerland

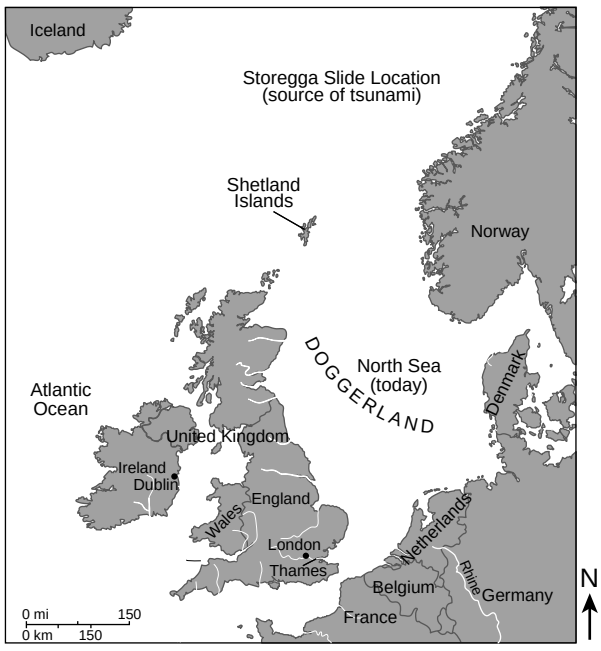
Doggerland was an area of land once occupied by ancient humans. Glaciers once covered the area but melted between 20,000 and 9000 years before present (ybp). Doggerland connected present-day France to England. The maps below show some information about Doggerland.

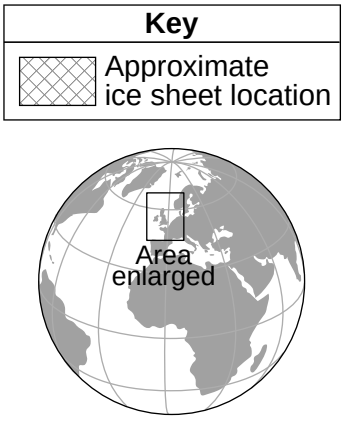
Map 1: Doggerland
18,000 Years Before Present

Map 2: Doggerland
9000 Years Before Present



Map 3: Doggerland Today





24 Which claim summarizes the climate change that most likely occured at Dublin, Ireland, over the last 18,000 years?

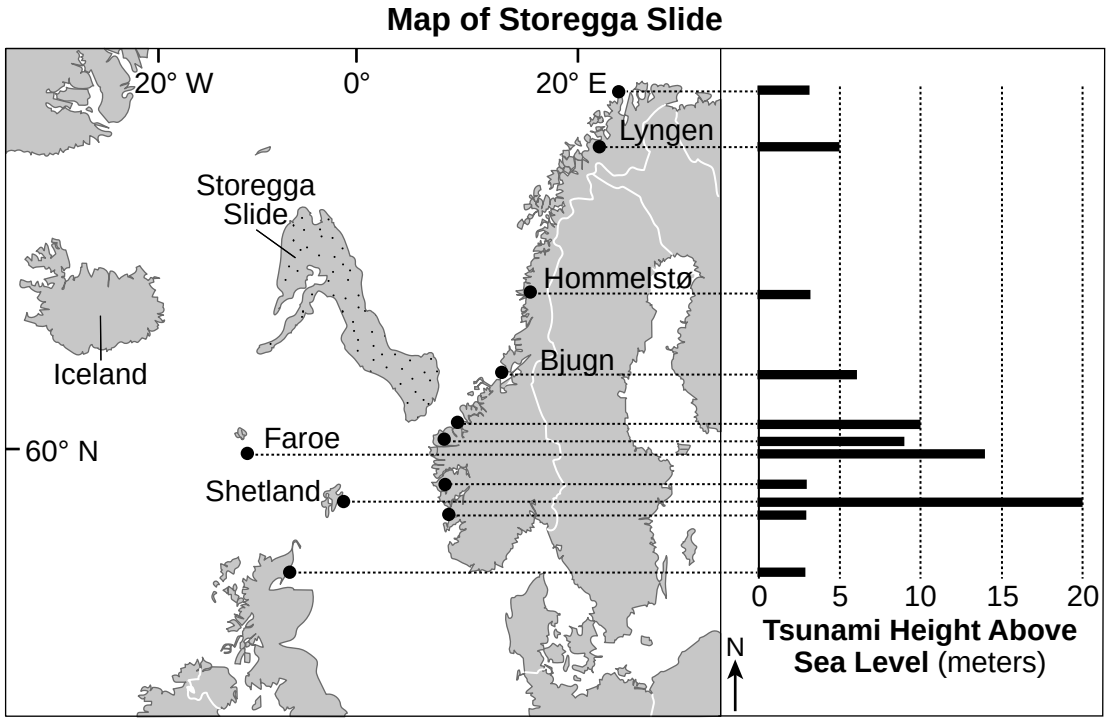
(1) The East Greenland Current caused temperatures to increase and humidity to decrease in Ireland.

(2) The Norwegian Current caused temperatures to decrease and humidity to decrease in Ireland.

(3) The North Atlantic Current caused temperatures to increase and humidity to increase in Ireland.

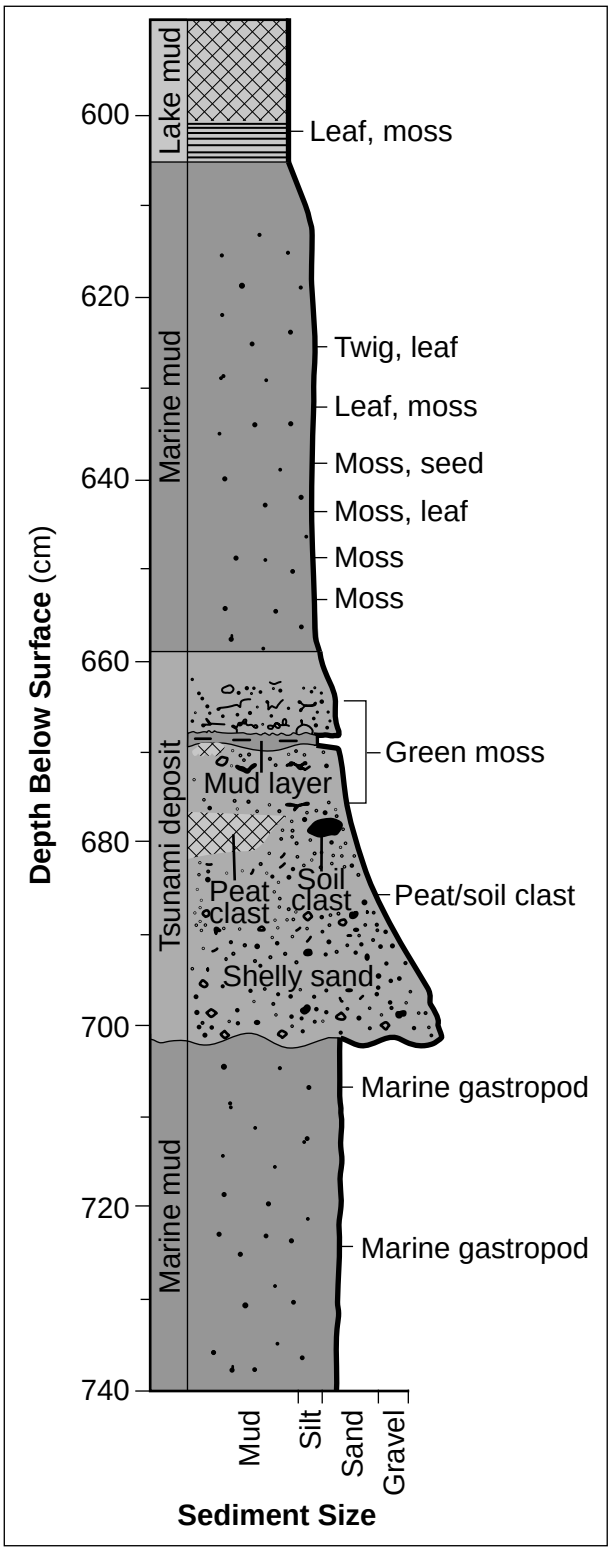
(4) The Canary Current caused temperatures to decrease and humidity to increase in Ireland.

The underwater Storegga landslide also affected the Doggerland region. The map below shows some information about the Storegga Slide and the associated tsunami that occurred 8200 years ago.



The *Hommelstø Sediment Cross-Section* was drawn after tsunami deposits were analyzed at Hommelstø, Norway.

Hommelstø Sediment Cross-Section



25 Which row correctly completes the passage below?

When the Storegga Slide triggered a tsunami, the initial wave would have caused a ___A___ process at the coastline of the Shetland Islands. The coastline would have experienced ___B___. The location of ___C___ experienced less impact from the tsunami with a wave height of about ___D___.

Row	A	B	C	D
(1)	constructive	erosion	Faroe	14 meters
(2)	constructive	deposition	Lyngen	2 meters
(3)	destructive	erosion	Hommelstø	3 meters
(4)	destructive	deposition	Bjugn	6 meters

Students analyzing the *Hommelstø Sediment Cross-Section* made the five claims below.

Claims

I – Marine gastropods are the oldest remains of organic material.

II – The tsunami deposits contain the largest-sized sediments.

III – Peat and soil clasts are only found at depths of 640 cm.

IV – Twigs, leaves, and moss in these deposits contain more than 75% of their original carbon-14.

V – The sediments and organic material at the 600 cm depth are most likely freshwater deposits.

26 Which three claims provide correct interpretations from data collected at Hommelstø?

(1) Claims I, II, and III

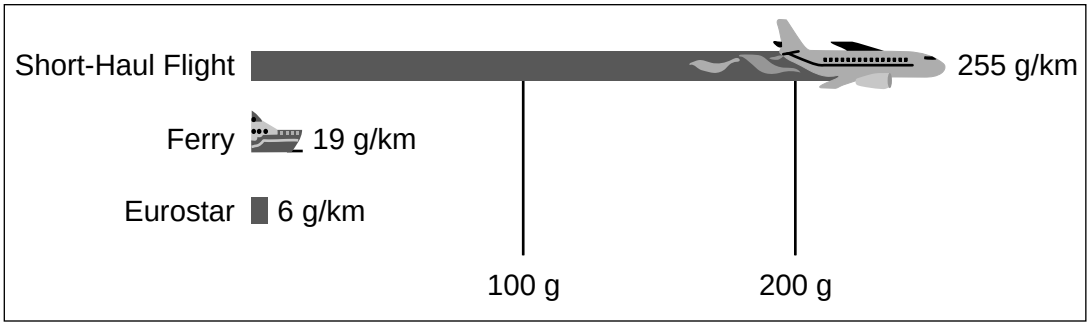
(2) Claims II, IV, and V

(3) Claims III, IV, and V

(4) Claims I, II, and V

Since 1994, England has once again been connected to France, but not by a land bridge like Doggerland. The high-speed Eurostar train uses the Channel Tunnel to carry 11 million travelers under the English Channel every year. Prior to 1994, travelers crossing the English Channel relied mostly on airplanes and ferries. The infographic below shows some information about carbon emissions for different modes of travel.

The Average Amount of Carbon Released (g/km) per Passenger



27 Identify the Earth system that is being impacted the ***least*** by the Eurostar train. Use numerical evidence to explain how this solution reduces the impact on the system. [1]

Earth system: _____

Explanation: _____

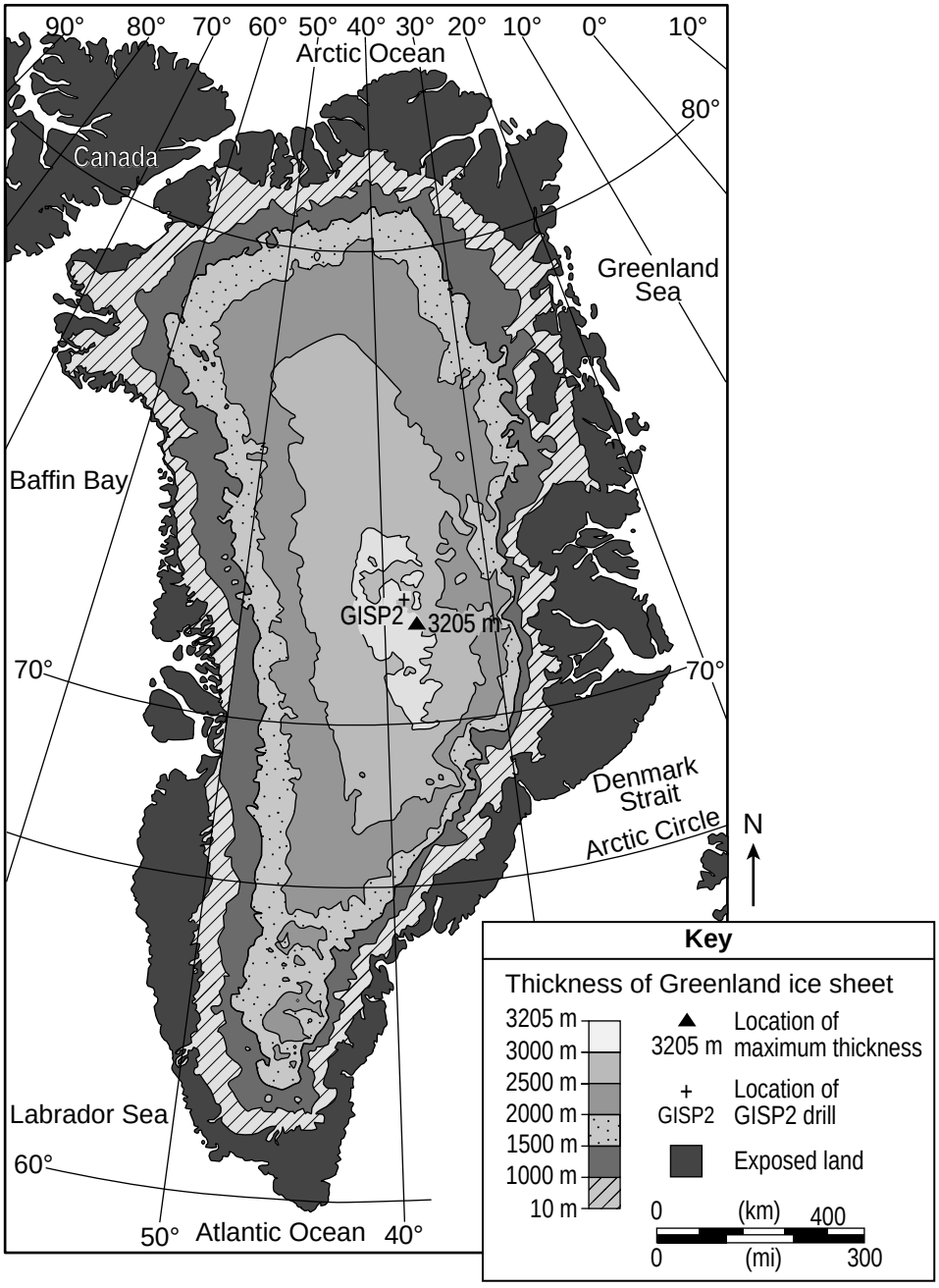
_____

Base your answers to questions 28 through 32 on the information below and on your knowledge of Earth and Space Sciences. Some questions may require the use of the ***2024 Edition Reference Tables for Earth and Space Sciences***.

Greenland's Glacial Ice

The Greenland ice sheet is a large body of ice that covers about 80% of the landmass. This ice is a significant portion of Earth's freshwater storage and plays an important role in Earth's climate. For this reason, scientists have been studying how this ice sheet has been changing for many decades.

Map of Greenland Ice Coverage



28 Based on the map, which evidence-based claim correctly identifies how a change in climate most likely affected the current pattern of ice thickness on Greenland?

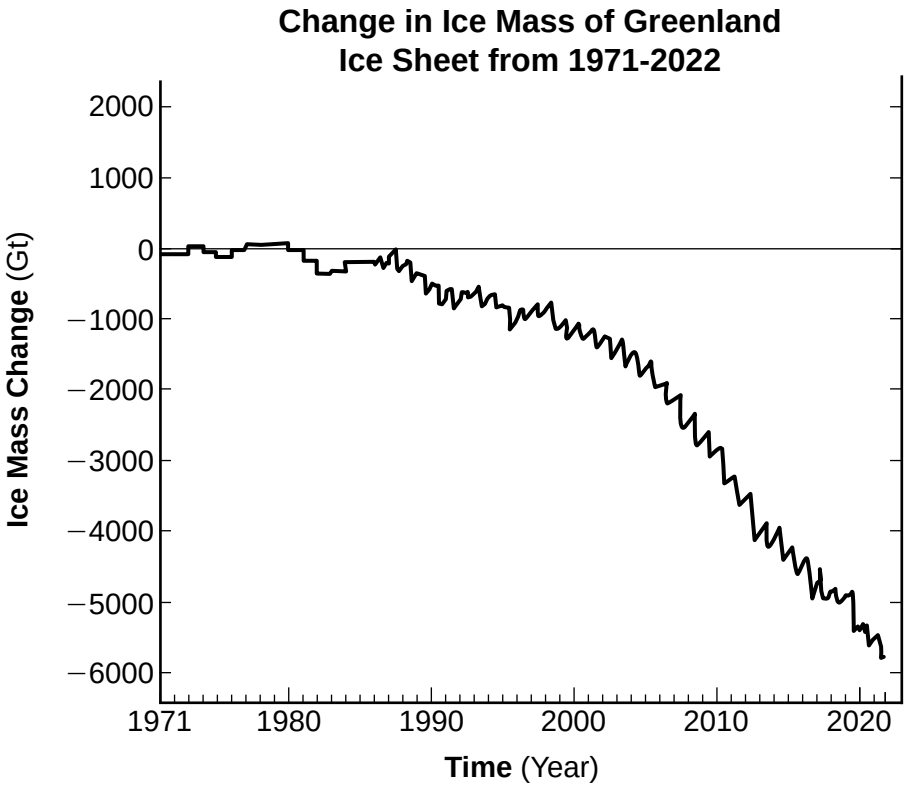
(1) Cooling of climate in polar regions caused no ice and more exposed land near Baffin Bay than along the Denmark Strait.

(2) A warmer climate at lower elevations caused ice to be thickest near the center of Greenland where it is over 3000 m and thins to 0 m along coastlines.

(3) Cold climates caused ice ranges from 0 m at the edges to over 2500 m near the GISP 2 drill location.

(4) A warming climate produced no general ice-thickness pattern since land is exposed along the edges of the entire coastline.

The graph below shows some information about the change in ice mass in Gt (gigatons–billions of tons) from the Greenland Ice Sheet.



29 Using the information in the graph, make a claim that describes a feedback that occurs as a result of a change in ice mass on Greenland that caused a change to Earth's oceans. [1]

30 Based on the trend shown in the graph, which claim correctly describes the rate of change in ice mass from 2010 to 2022?

(1) Ice mass rate of change was a loss of about 250 Gt/year.

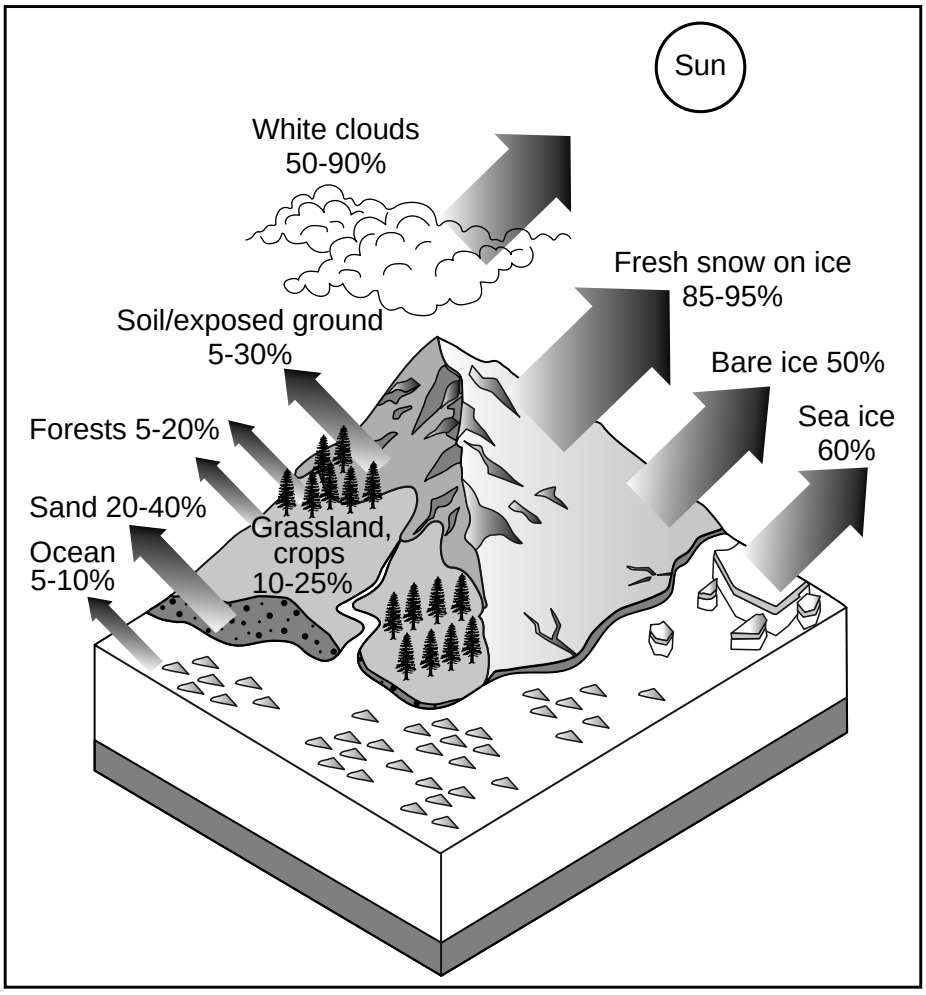
(2) Ice mass rate of change was a loss of about 250 Gt in 12 years.

(3) The rate of change in ice mass loss was less from 2010 to 2022 than it was in any previous 12-year span.

(4) From 2010 to 2022, ice mass loss was 3000 Gt/year.

The model below shows some information about the albedo effect. This is the effect of different types of Earth surfaces on the ability to reflect the Sun's radiation. If sea ice reflects 60% of the Sun's energy, then 40% of the Sun's energy is absorbed by the sea ice.

Model of Percent of Sunlight Reflected by Various Surfaces



31 Using information in both the model and graph, write the correct letter from the choices below on the blank to complete each statement about the albedo effect. [1]

Choices for Statement 1:	Choices for Statement 2:	Choices for Statement 3:
A. 20% more radiation B. 60% more radiation C. 80% more radiation	D. flow into Earth's surface E. being reflected from Earth's surface F. flow out from more bare ice	G. to cause regional and global cooling and cause sea level change H. to cause regional warming and cause sea level change I. to maintain the current polar climate and sea level

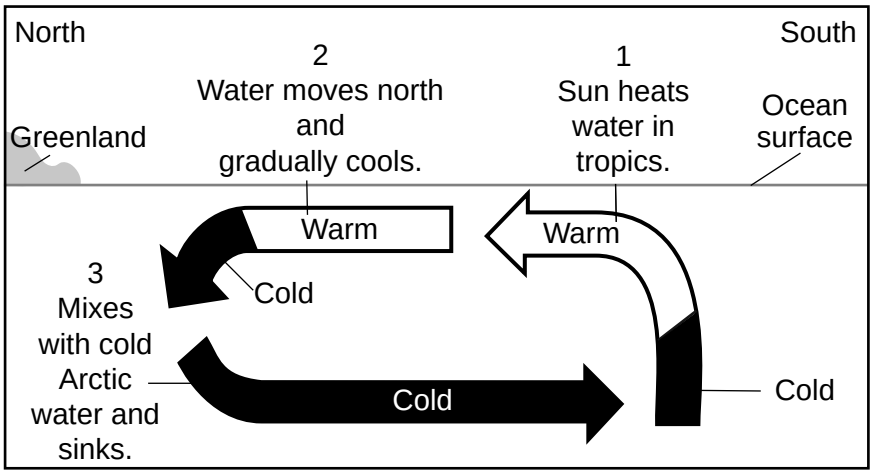
Statement 1: Using the maximum values in the model, compared to bare ice melting on the Greenland ice sheet, as more soil/ground is exposed, approximately _____ is absorbed by the exposed ground.

Statement 2: More exposed ground on Greenland's landmass will result in increased energy _____ during daylight hours.

Statement 3: The resulting effect on the climate of Greenland will be _____.

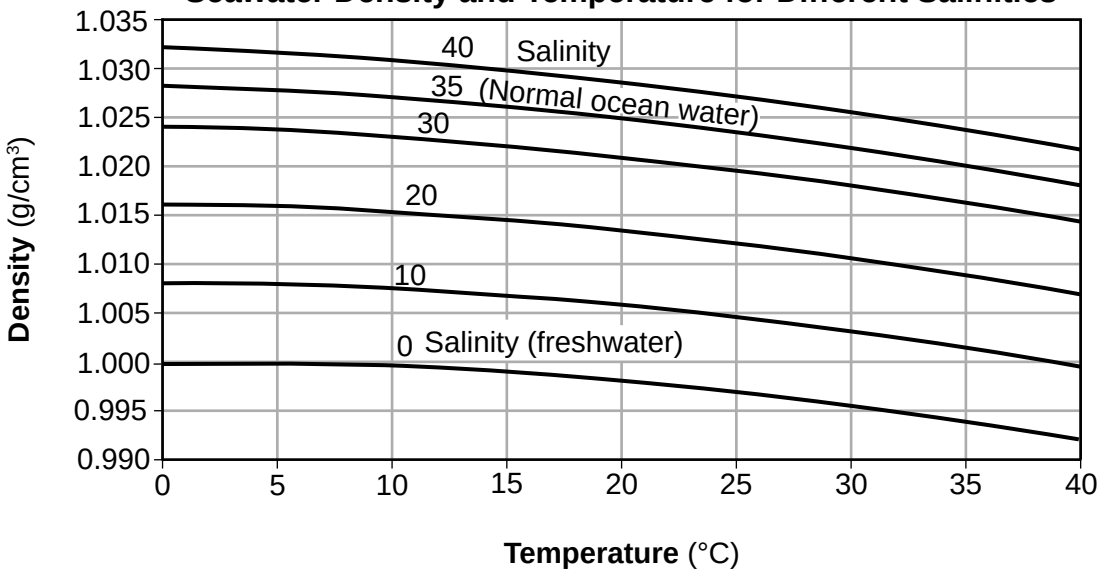
The model below shows some information about ocean current circulation.

How Ocean Currents Work Model

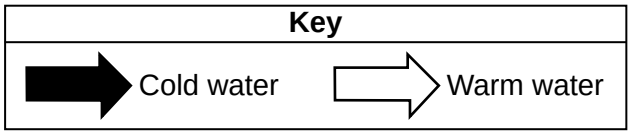


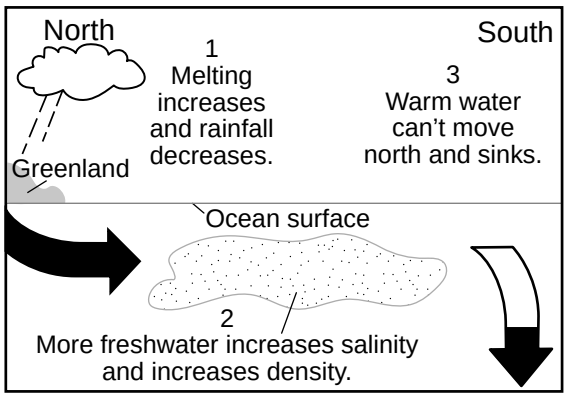
The graph below shows information about some seawater characteristics. Salinity is measured in the number of grams of salts (chlorides) per kilogram of water or parts per thousand (ppt).

Seawater Density and Temperature for Different Salinities

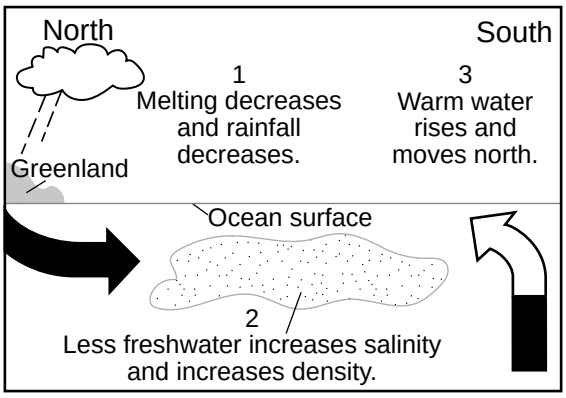


32 Based on the model and the graph, which model below correctly summarizes changes to an Earth system off the coast of Greenland?

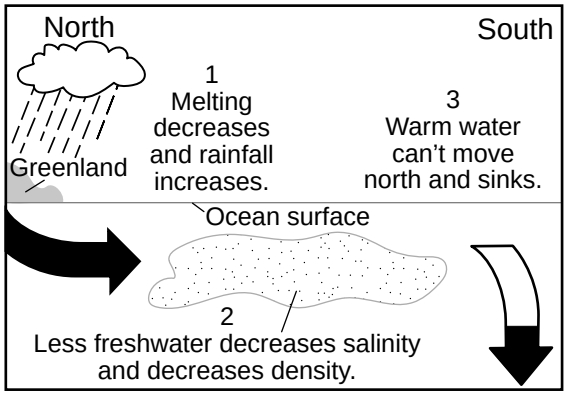




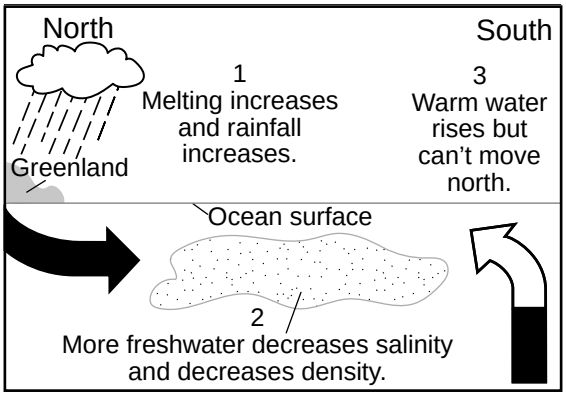
(1)



(3)



(2)



(4)

Base your answers to questions 33 through 37 on the information below and on your knowledge of Earth and Space Sciences. Some questions may require the use of the ***2024 Edition Reference Tables for Earth and Space Sciences***.

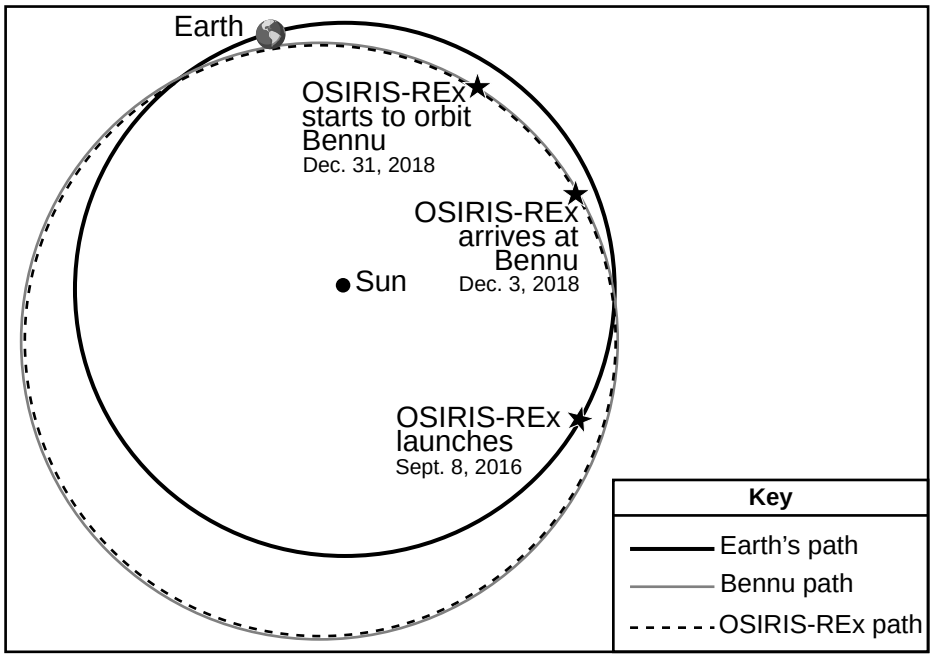
Bennu

Bennu is a small asteroid with an age of approximately 4.6 billion years. Bennu currently orbits the Sun at a mean distance of approximately 1.1 AU. One astronomical unit (AU) is equal to the mean distance between Earth and the Sun. Bennu's orbit is tilted five degrees relative to Earth's orbit.

In 2016, NASA sent the OSIRIS-REx spacecraft to study Bennu. The asteroid's surface was mapped in 2018. A sample of asteroid material was collected in 2020 and returned to Earth in 2023. Initial studies of the sample suggest Bennu's original source contained water, ice, and carbon monoxide ice. Carbon monoxide ice forms at approximately 4500 million kilometers (30 AU) from the Sun.

The model below shows some information about the paths of Earth, Bennu, and the OSIRIS-REx spacecraft.

Paths of Earth, Bennu, and OSIRIS-REx



(Not drawn to scale)

33 A student wanted to identify the mathematical and computational information needed to determine when OSIRIS-REx could land on Bennu. Which table correctly lists the period of revolution and mean distance data needed to predict when OSIRIS-REx will cross Bennu's orbit, allowing it to land on Bennu?

Earth's Period of Revolution (Earth Days)	365.26
Earth's Mean Distance from Sun (million km)	149.6
Bennu's Period of Revolution (Earth Days)	365.26
Bennu's Mean Distance from Sun (million km)	169.0

(1)

Earth's Period of Revolution (Earth Days)	365.26
Earth's Mean Distance from Sun (million km)	149.6
Bennu's Period of Revolution (Earth Days)	436.65
Bennu's Mean Distance from Sun (million km)	169.0

(3)

Earth's Period of Revolution (Earth Days)	365.26
Earth's Mean Distance from Sun (million km)	149.6
Bennu's Period of Revolution (Earth Days)	370.26
Bennu's Mean Distance from Sun (million km)	149.6

(2)

Earth's Period of Revolution (Earth Days)	365.26
Earth's Mean Distance from Sun (million km)	149.6
Bennu's Period of Revolution (Earth Days)	436.65
Bennu's Mean Distance from Sun (million km)	299.2

(4)

34 Which statement provides evidence about the formation and movement of Bennu through the solar system?

(1) Bennu formed inside Earth's orbit when the mass extinction of the dinosaurs occurred and then moved closer to Mars' orbit.

(2) Bennu formed near the orbit of Saturn when the oxygen revolution occurred on Earth and then moved closer to Neptune.

(3) Bennu formed in the asteroid belt when stromatolites were abundant on Earth and then moved closer to Saturn.

(4) Bennu formed near the orbit of Neptune at the same time the solar system formed and then moved closer to Earth.

Scientists have calculated that there is a slight chance that Bennu could collide with Earth in 2182. The potential for an impact between Bennu and Earth has prompted studies to prevent this event. Three options have been proposed to address this concern.

The first option is to use a "kinetic impactor." NASA has tested this option through a program called the Double Asteroid Redirection Test (DART). NASA carried out the experiment by striking Dimorphos with a small spacecraft at a speed of 6.6 km/s. This impact was enough to change the orbital speed and trajectory of Dimorphos.

A second option is to launch a nuclear warhead and have it explode near Bennu. The force of the explosion could alter Bennu's orbital path.

A third option is the Yarkovsky Effect. This is a naturally occurring phenomenon on small asteroids. It happens when the Sun's radiation strikes the object as it spins on its axis, changing its orbit over time. Scientists could increase the effect by painting or placing foil on the surface to increase the albedo of the asteroid.

35 Based on the cyclic motions of Bennu and Earth, describe the conditions that are necessary for Bennu to collide with Earth. [1]

36 Which statement describes why the speed of the DART spacecraft changed before it impacted Dimorphos?

(1) Its speed increased due to the Sun's gravitational pull.

(2) Its speed increased due to Dimorphos' gravitational pull.

(3) Its speed decreased due to Earth's gravitational pull.

(4) Its speed decreased due to Dimorphos' gravitational pull.

37 Place **one** check mark in each row to identify the option (Options 1 and 2 *or* Option 3) that meets the criteria and constraints listed in the table below. [1]

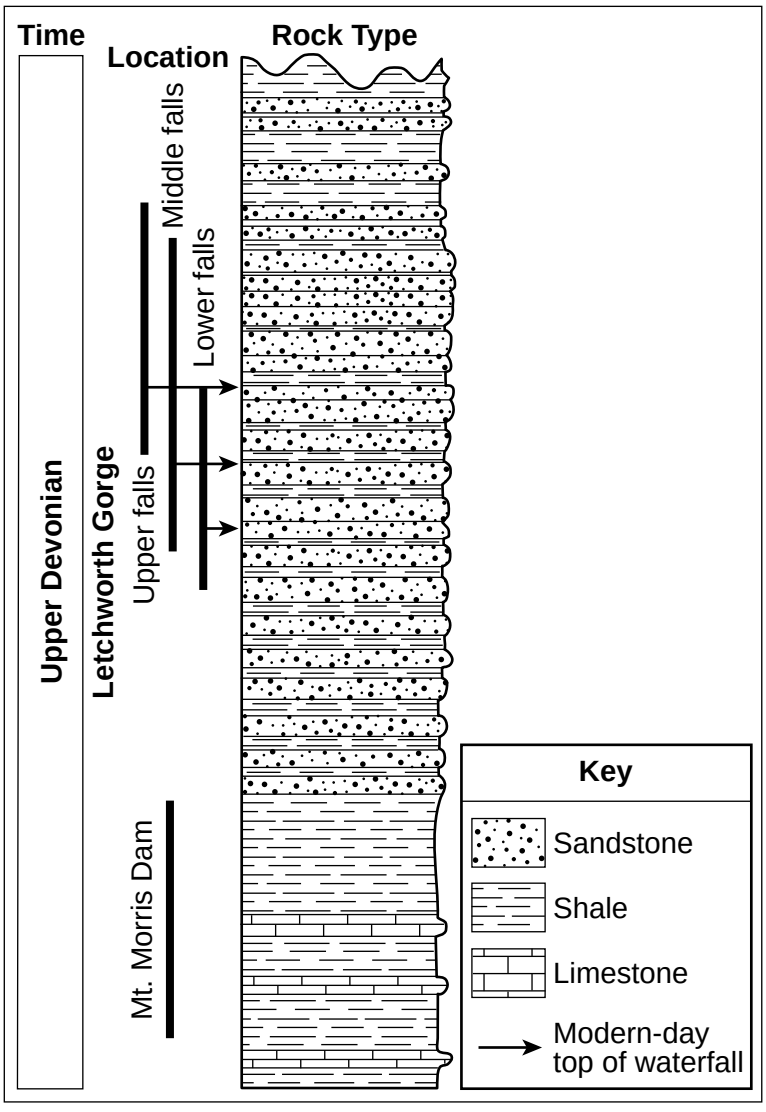
Criteria/Constraint	Options 1 and 2 (DART/Nuclear)	Option 3 (Yarkovsky Effect)
Occurs Continuously		
Solar Radiation		
Risk of Debris Striking Earth		
Causes Rapid Change in Orbit		

Base your answers to questions 38 through 41 on the information below and on your knowledge of Earth and Space Sciences. Some questions may require the use of the ***2024 Edition Reference Tables for Earth and Space Sciences***.

Mount Morris Dam in Letchworth State Park

Letchworth Gorge is located southwest of Rochester, New York, where the Genesee River flows through the local landscape. It is sometimes referred to as the "Grand Canyon of the East" due to the height of its vertical face. The rock seen in the walls of the gorge consists primarily of shales and sandstones. These rocks formed during the Late Devonian Period. The Mount Morris Dam is located at the northern end of Letchworth Gorge.

Model of Rock Types for a Portion of Letchworth Gorge



(Not drawn to scale)

38 In the Letchworth Gorge, the Genesee River erodes sandstones and shale at different rates. Check the box to indicate which rock is more resistant to the effects of the Genesee River. Support your choice with **one** piece of evidence from the model. [1]

☐ Sandstone ☐ Shale

Evidence: _____

_____

_____

The photograph below shows the gorge in Letchworth State Park along the Genesee River. Two locations in the gorge are labeled *X* and *Y*.

Letchworth Gorge

Students in a class were tasked with identifying a new hiking route along the edge of the section of the Genesee River shown in the photo.

A student makes the claim below:

The safest route of the hiking trail should be near location ___A___ because at ___B___ there is a greater chance of weathering and erosion due to ___C___, which increases the risk of ___D___ along the trail.

Choices for:

A	**B**	**C**	**D**
X or Y	*X or Y*	wind *or* gravity	flooding *or* landslides

39 Which sequence of terms best completes the claim?

(1) **A:** *X* **B:** *Y* **C:** gravity **D:** landslides

(2) **A:** *X* **B:** *Y* **C:** gravity **D:** flooding

(3) **A:** *Y* **B:** *X* **C:** wind **D:** landslides

(4) **A:** *Y* **B:** *X* **C:** wind **D:** flooding

40 What are the constructive processes most likely responsible for the distribution of rock layers found in the Letchworth Gorge?

(1) recrystallization, deposition, and weathering of rocks

(2) solidification, cooling, and outgassing of sediments

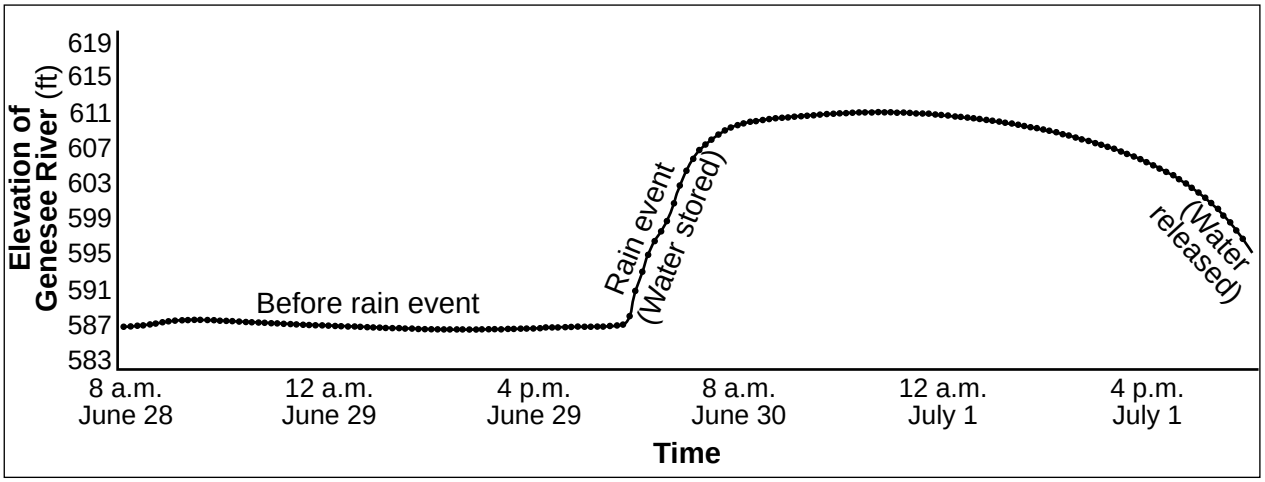
(3) erosion, mineral precipitation, and folding of rocks

(4) burial, compaction, and mineral precipitation of sediments

There are multiple stream monitoring stations located along the Genesee River and at the Mount Morris Dam to collect data on the level of the river.

The graph below shows some information about the Genesee River during a rain event.

Rain Event at Mount Morris Dam



41 Which statement identifies how the construction of the Mount Morris Dam has impacted the ability to control rain events?

(1) Construction of the dam has controlled river elevations to increase the availability of fresh water for the residents of Rochester.

(2) Construction of the dam has controlled water levels in the Genesee River, reducing the chance of flooding and property loss for residents of Rochester.

(3) Construction of the dam has controlled river elevations so that more swimming areas could be created within Letchworth State Park.

(4) Construction of the dam has controlled the amount of erosion in the Genesee River, causing more sediment to build up in Rochester water systems.

Base your answers to questions 42 through 45 on the information below and on your knowledge of Earth and Space Sciences. Some questions may require the use of the ***2024 Edition Reference Tables for Earth and Space Sciences***.

Energy and Mineral Resources

The shift toward renewable energy resources is growing worldwide. Mineral resources such as copper, nickel, zinc, and rare Earth minerals are important. They are critical to the production and distribution of traditional and renewable energy sources.

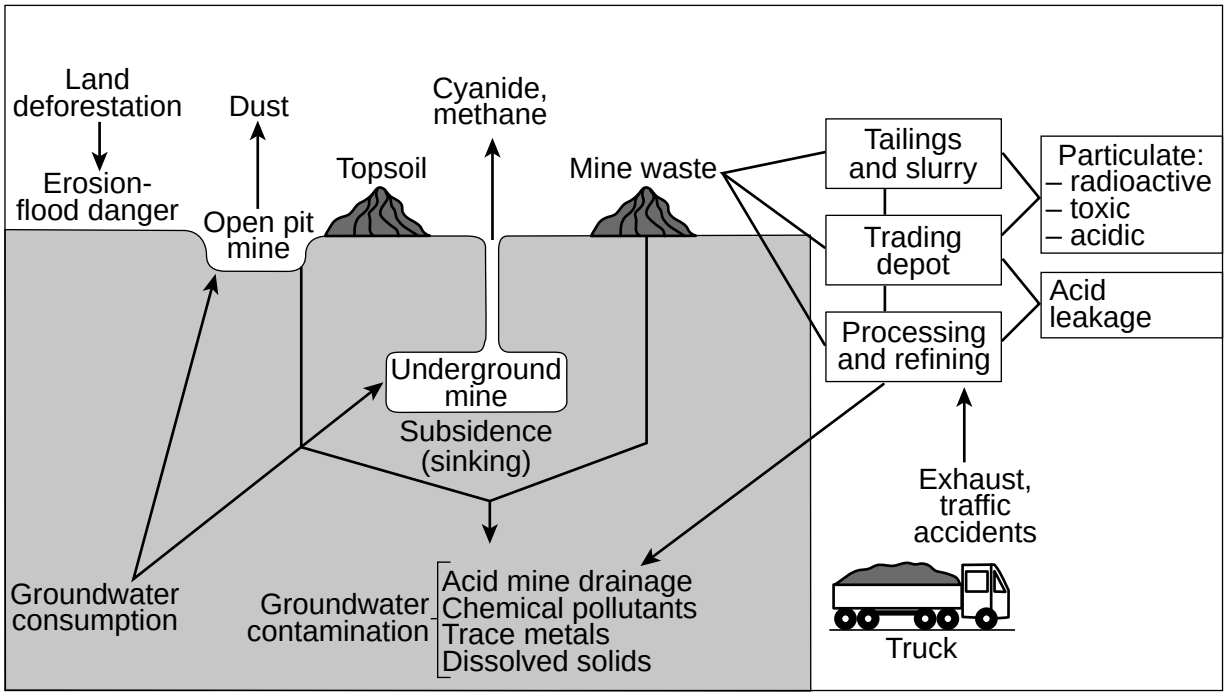
The United States imports more mineral resources than it produces. Other countries work toward similar clean energy transitions. The United States will be required to compete with other countries for these mineral resources.

The photograph below shows the open pit mine near Salt Lake City, Utah.

Kennecott Utah Copper Mine

The process of copper mining has environmental impacts on Earth systems. The model below shows some information about the steps involved in mining copper at and below Earth's surface.

Model of Mining and its Potential Effects on the Environment



42 A student makes a claim that copper mines negatively affect Earth's surface, causing a change to Earth's systems. Identify the information in the model that provides evidence for a negative effect on Earth's surface and a resulting change to **one** Earth system that supports this claim. [1]

Negative effect: _____

Resulting change to one Earth system: _____

_____

_____

Over 50 kg of copper are used in the manufacture of most electric cars. Students researched information on the difference between gas-powered and electric cars. The information found is summarized below.

Comparison Between Gas-Powered and Electric Cars

Gas-Powered Car	Electric Car
• Manufacture requires two different minerals • 411 grams of CO_2 released per mile • Heavier engine (~184 kilograms) • 22.3 kilograms of mined copper needed • Median driving range is 403 miles per tank of gas • Average cost for driving is $1117 per year	• Manufacture requires seven different minerals • 32 grams of CO_2 released per mile • Motor weighs 76 kilograms • 340 kilograms heavier than gas cars (on average) • Battery contains 185 kilograms of minerals • Can contain more than 1 mile of mined copper wiring to convert electrical energy into mechanical energy (~53.2 kilograms) • Median driving range is 234 miles per charge • Average cost for driving is $485 per year

43 When comparing gas-powered cars to electric cars, which statement correctly summarizes the type of car that has a lower environmental impact related to the mining industry while providing reliable transportation for long distances?

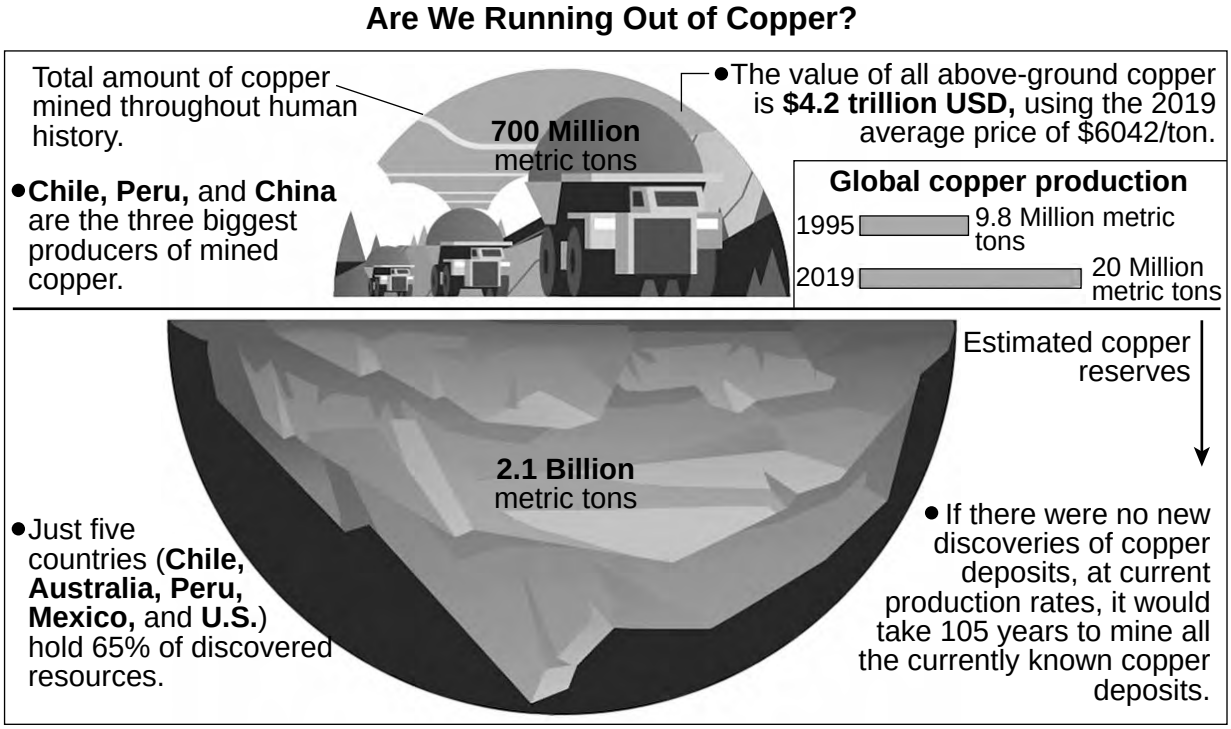
(1) The electric car has a lower environmental impact from mining because the motor only weighs 76 kilograms and has an average driving range of 234 miles.

(2) The electric car has a lower environmental impact because it emits only 32 grams per mile and uses only 53.2 kilograms of copper.

(3) The gas-powered car has a lower environmental impact because it only uses 22.3 kilograms of copper to manufacture and has a median driving range of 403 miles.

(4) The gas-powered car has a lower environmental impact because it costs about $500 more to operate than an electric car and releases only 411 grams of CO_2 per mile.

Copper is an affordable and versatile metal. It is critical for economic development. The infographic below has information about the amount of copper mined on Earth through 2019 and the estimated copper reserves remaining on Earth.



44 Which explanation uses evidence from the infographic to most correctly explain how human activity is being influenced by the availability of copper used in the manufacture of new electric vehicles?

(1) As copper reserves are depleted, companies will be forced to lower the price of copper below the 2019 average of $6042 per ton in countries with copper mines.

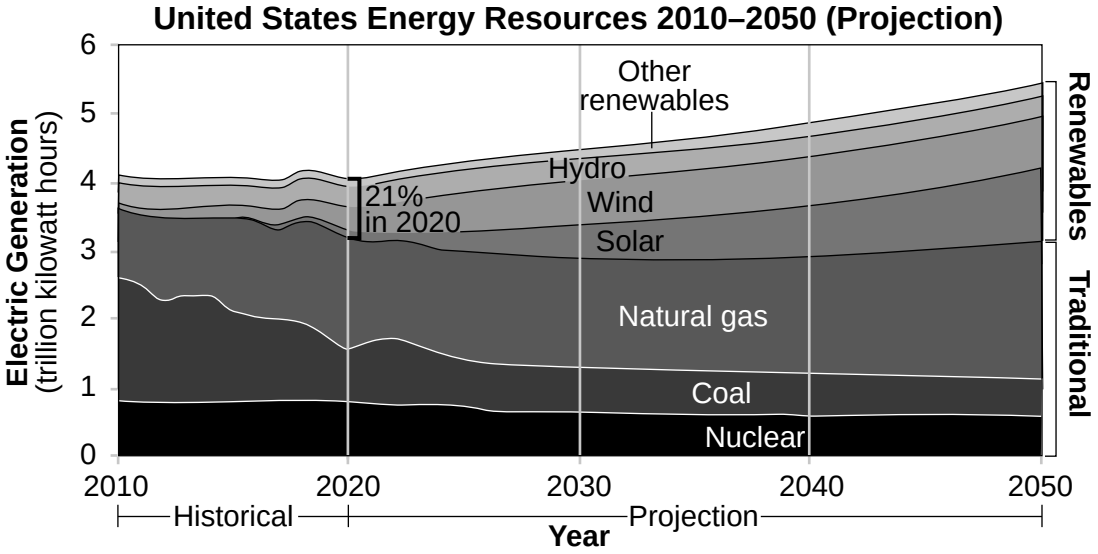
(2) The five countries with 65% of copper reserves will need to reduce copper production to conserve resources in order to make more electric cars.

(3) Since global copper production more than doubled between 1995 and 2019, all countries with copper reserves will need to open new mines to meet the immediate demand for the manufacture of electric cars.

(4) Copper recycling will need to increase in order to meet the demand for electric car manufacture beyond 105 years from now.

Human populations have realized that there is a limited supply of traditional energy sources. For that reason, countries have been working on developing renewable energy sources. In 2020, renewable energy sources made up 21% of all electric generation resources in the United States.

The graph below shows some information about electric energy generation resources in the United States.



45 Which evidence-based statement correctly describes how the electrical energy generation resources in the United States are projected to change as the demand for electricity increases?

(1) By 2030, hydro will surpass nuclear electric generation.

(2) By 2050, renewables will surpass natural gas as the largest source of electric generation.

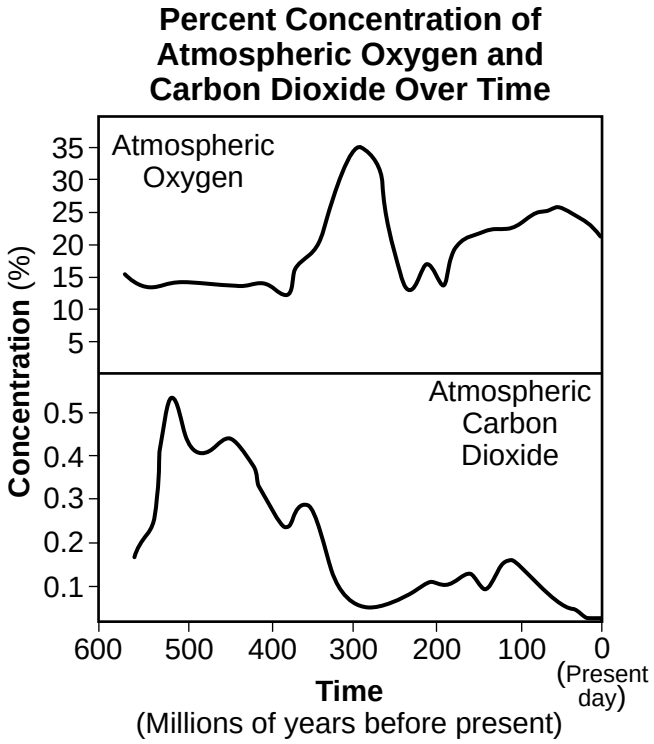
(3) Energy generation from coal is projected to increase by 2035.

(4) From 2020 to 2050, wind energy is projected to increase more than solar energy.

Base your answers to questions 46 through 50 on the information below and on your knowledge of Earth and Space Sciences. Some questions may require the use of the ***2024 Edition Reference Tables for Earth and Space Sciences***.

The Carboniferous Period

Plants became firmly established on land during the Carboniferous Period. Evidence of great forests and giant swamps have been found, dating to the latter part of the Carboniferous Period. This changed the concentration of atmospheric oxygen. It also resulted in a change to the concentration of atmospheric carbon dioxide. The graph below shows the changes in atmospheric gas concentrations over time.



46 Which claim accurately identifies a change in atmospheric oxygen levels due to a change in Earth's biosphere in the Carboniferous Period?

(1) Oxygen levels increased as a result of deforestation in the biosphere.

(2) Oxygen levels increased as a result of decreased respiration in the biosphere.

(3) Oxygen levels increased as a result of increased photosynthesis in the biosphere.

(4) Oxygen levels increased as a result of decreased transpiration in the biosphere.

47 Scientists claim Earth's surface air temperature changed during the late Carboniferous Period. Analyze the data provided to support this claim by identifying the change to Earth's atmospheric composition that would result in a temperature change. Also, describe this air temperature change. [1]

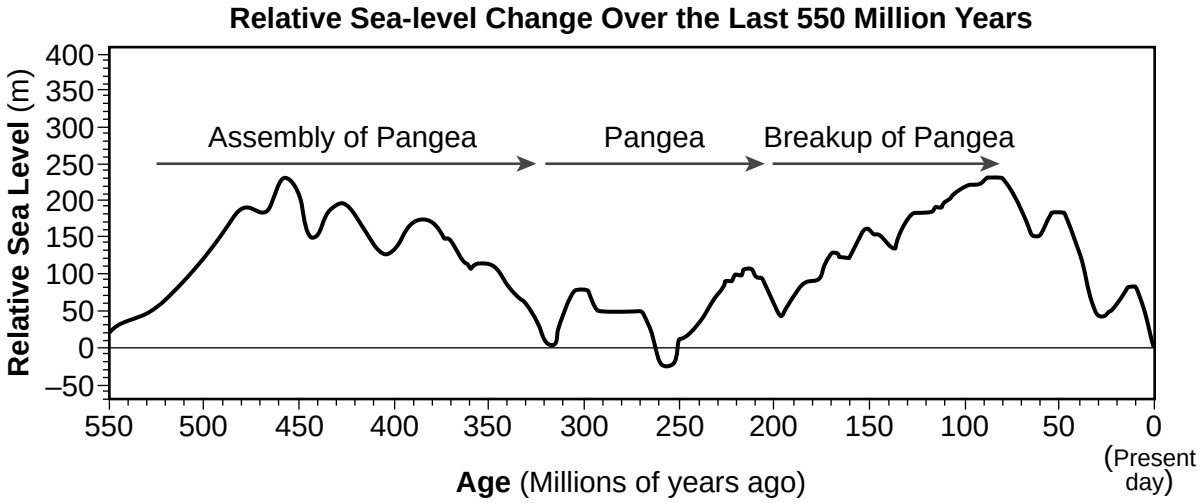
Change in atmospheric composition: _____

_____

Change in surface air temperature: _____

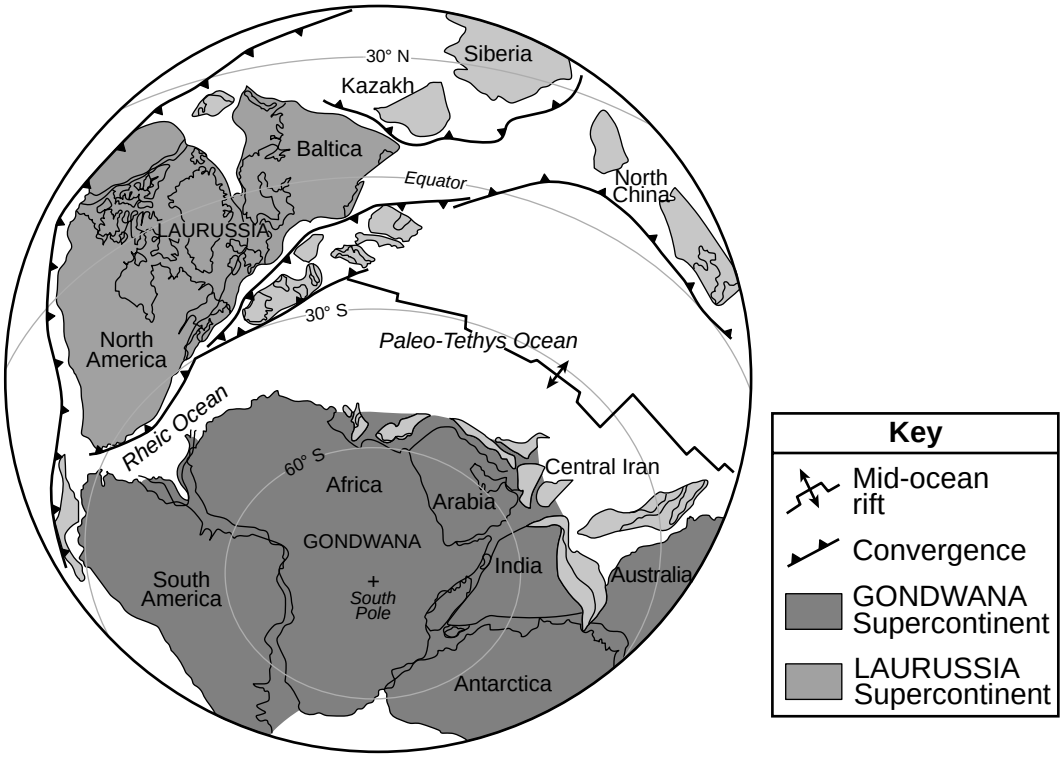
_____

Students studying marine fossils from the early to the late Carboniferous Period noticed a substantial decrease in the number of fossilized marine species in rocks. While investigating this phenomenon, students considered several factors including sea level change, glaciation, and movement of tectonic plates. The graph shows information about sea level changes and changes in Pangea during the same time period.

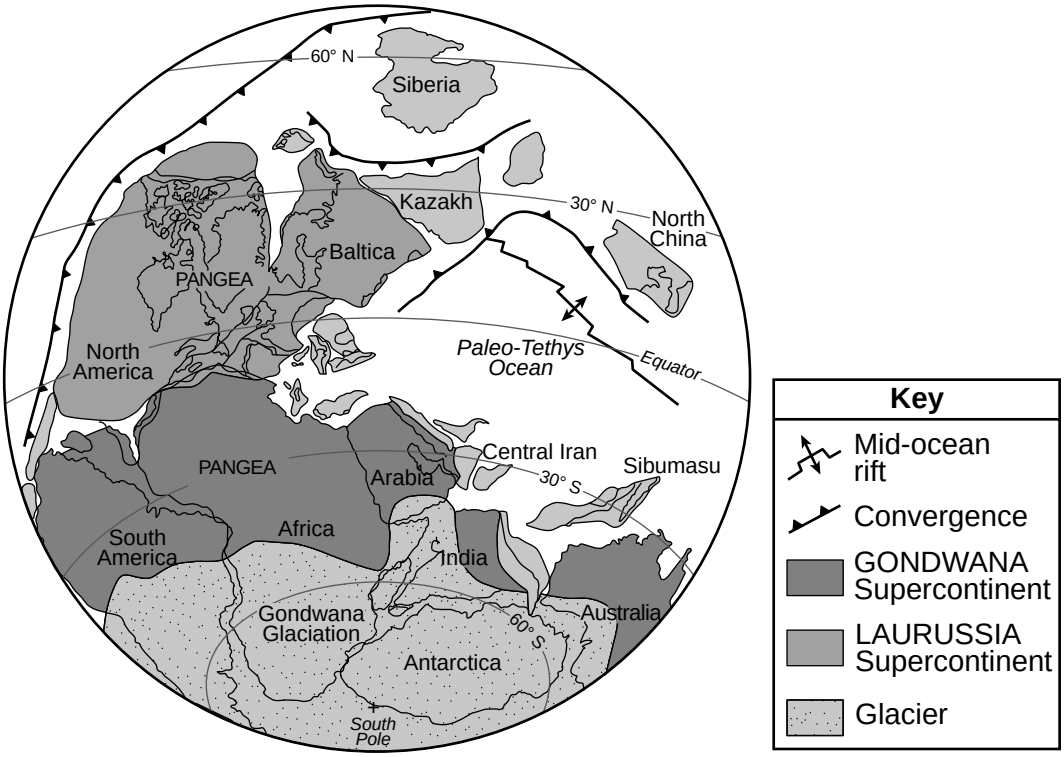


The students also analyzed information from maps of both the Early and Late Carboniferous Period.

Map of the Early Carboniferous: 340 Million Years Ago

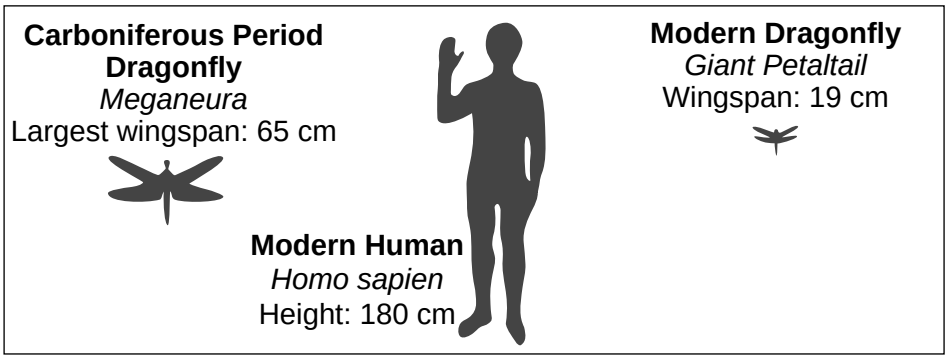


Map of the Late Carboniferous: 310 Million Years Ago



Some Carboniferous rocks contain fossils of the dragonfly *Meganeura*, an extinct insect related to modern dragonflies.

Relative Size Comparisons for Modern Dragonflies and Carboniferous Dragonflies



(Not drawn to scale)

The data table below compares the differences seen in modern dragonflies and Carboniferous *Meganeura* dragonflies due to differences in atmospheric gas concentrations.

Effect of Atmospheric Oxygen on Body Size of Dragonflies

Atmospheric Habitat	**Largest Wingspan** (cm)
Modern Habitat (21% Atmospheric Oxygen)	19.0 cm
Carboniferous Habitat (31% Atmospheric Oxygen)	65 cm

48 Construct an argument that predicts the relative wingspan of a dragonfly if it were to have lived in the atmospheric conditions that existed 200 million years ago, compared to modern-day *or* Carboniferous Period dragonfly species. [1]

The students summarized their research from the graph and the maps to make the claim: "A decrease of marine organisms from the early to the late Carboniferous Period is a result of sea level change and glaciation on Earth."

49 Which pieces of evidence from the maps and graph support the students' claim?

(1) An increase in glaciation added ice to the cryosphere and lowered ocean water levels in the hydrosphere.

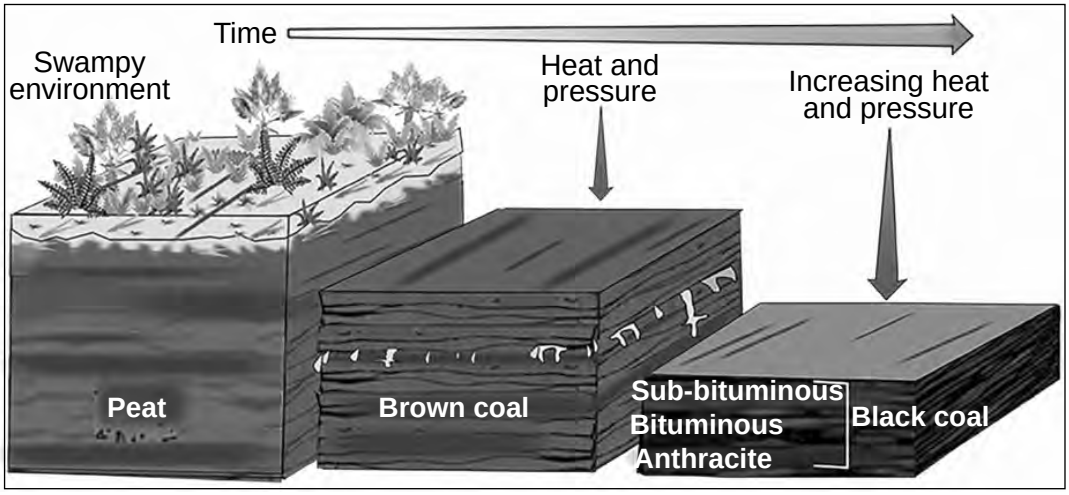
(2) An increase in water levels in the hydrosphere were a result of melting ice from the cryosphere.

(3) Water levels in Earth's hydrosphere and the amount of ice in the cryosphere both increased.

(4) Water levels in the hydrosphere and ice levels in the cryosphere both decreased.

Carboniferous coal deposits can be found worldwide. Vegetation from Carboniferous forests accumulated in layers in large marshy areas. The biomass was buried and became layers of peat. The model below shows some information about how coal forms.

Formation of Coal Model



50 The cycling of carbon through Earth's spheres results in different stages of coal formation. Which piece of evidence could support the claim that environments of early coal formation can be found in New York State?

(1) Watertown, located in the Erie-Ontario Lowlands, contains carbonate rock which will become brown coal.

(2) Glens Falls, located in the Hudson River Valley, contains cement which forms from bituminous coal.

(3) Geneva, located in the Tug Hill Plateau, contains peat which forms from sub-bituminous coal.

(4) Binghamton, located in the Allegheny Plateau, contains peat which forms into brown coal.

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EARTH AND SPACE SCIENCES

The State Education Department / The University of the State of New York

Regents Examination in Earth and Space Sciences – January 2026

Scoring Key: (Multiple-Choice Questions)

Examination	Date	Question Number	Scoring Key	Question Type	Credit	Weight
Earth and Space Sciences	January '26	**2**	2	MC	1	1
Earth and Space Sciences	January '26	**3**	1	MC	1	1
Earth and Space Sciences	January '26	**4**	1	MC	1	1
Earth and Space Sciences	January '26	**7**	2	MC	1	1
Earth and Space Sciences	January '26	**8**	2	MC	1	1
Earth and Space Sciences	January '26	**9**	1	MC	1	1
Earth and Space Sciences	January '26	**10**	1	MC	1	1
Earth and Space Sciences	January '26	**11**	1	MC	1	1
Earth and Space Sciences	January '26	**12**	4	MC	1	1
Earth and Space Sciences	January '26	**14**	3	MC	1	1
Earth and Space Sciences	January '26	**17**	3	MC	1	1
Earth and Space Sciences	January '26	**18**	3	MC	1	1
Earth and Space Sciences	January '26	**20**	4	MC	1	1
Earth and Space Sciences	January '26	**21**	3	MC	1	1
Earth and Space Sciences	January '26	**23**	2	MC	1	1
Earth and Space Sciences	January '26	**24**	3	MC	1	1
Earth and Space Sciences	January '26	**25**	3	MC	1	1
Earth and Space Sciences	January '26	**26**	4	MC	1	1
Earth and Space Sciences	January '26	**28**	2	MC	1	1
Earth and Space Sciences	January '26	**30**	1	MC	1	1
Earth and Space Sciences	January '26	**32**	4	MC	1	1
Earth and Space Sciences	January '26	**33**	3	MC	1	1
Earth and Space Sciences	January '26	**34**	4	MC	1	1
Earth and Space Sciences	January '26	**36**	2	MC	1	1
Earth and Space Sciences	January '26	**39**	1	MC	1	1
Earth and Space Sciences	January '26	**40**	4	MC	1	1
Earth and Space Sciences	January '26	**41**	2	MC	1	1
Earth and Space Sciences	January '26	**43**	3	MC	1	1
Earth and Space Sciences	January '26	**44**	4	MC	1	1
Earth and Space Sciences	January '26	**45**	2	MC	1	1
Earth and Space Sciences	January '26	**46**	3	MC	1	1
Earth and Space Sciences	January '26	**49**	1	MC	1	1
Earth and Space Sciences	January '26	**50**	4	MC	1	1

Regents Examination in Earth and Space Sciences – January 2026

Scoring Key: Constructed-Response Questions

Examination	Date	Question Number	Scoring Key	Question Type	Credit	Weight
Earth and Space Sciences	January '26	**1**	–	CR	1	1
Earth and Space Sciences	January '26	**5**	–	CR	1	1
Earth and Space Sciences	January '26	**6**	–	CR	1	1
Earth and Space Sciences	January '26	**13**	–	CR	1	1
Earth and Space Sciences	January '26	**15**	–	CR	1	1
Earth and Space Sciences	January '26	**16**	–	CR	1	1
Earth and Space Sciences	January '26	**19**	–	CR	1	1
Earth and Space Sciences	January '26	**22**	–	CR	1	1
Earth and Space Sciences	January '26	**27**	–	CR	1	1
Earth and Space Sciences	January '26	**29**	–	CR	1	1
Earth and Space Sciences	January '26	**31**	–	CR	1	1
Earth and Space Sciences	January '26	**35**	–	CR	1	1
Earth and Space Sciences	January '26	**37**	–	CR	1	1
Earth and Space Sciences	January '26	**38**	–	CR	1	1
Earth and Space Sciences	January '26	**42**	–	CR	1	1
Earth and Space Sciences	January '26	**47**	–	CR	1	1
Earth and Space Sciences	January '26	**48**	–	CR	1	1

Key
MC = Multiple-choice question
CR = Constructed-response question

The chart for determining students' final examination scores for the **January 2026 Regents Examination in Earth and Space Sciences** will be available on the Department's web site at **https://www.nysedregents.org/earth_space_sciences/** no later than January 23, 2026. Conversion charts provided for the previous administrations of the Physical Setting/Earth Science examination must NOT be used to determine students' final scores for this administration.

FOR TEACHERS ONLY

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

EARTH AND SPACE SCIENCES

Friday, January 23, 2026 — 9:15 a.m. to 12:15 p.m., only

RATING GUIDE

Directions to the Teacher:

Refer to the directions on page 2 before rating student papers.

Updated information regarding the rating of this examination may be posted on the New York State Education Department's web site during the rating period. Check this web site at: https://www.nysed.gov/state-assessment/high-school-regents-examinations and select the link "Scoring Information" for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and several times throughout the Regents Examination period.

Directions to the Teacher

Follow the procedures below for scoring student answer papers for the Regents Examination in Earth and Space Sciences. Additional information about scoring is provided in the publication *Directions for Scoring Regents Examinations*.

Allow 1 credit for each correct response.

At least two science teachers must participate in the scoring of the open-ended questions on a student's paper. Each of these teachers should be responsible for scoring a selected number of the open-ended questions on each answer paper. No one teacher is to score more than approximately one-half of the open-ended questions on a student's answer paper. Teachers may not score their own students' answer papers.

Students' responses must be scored strictly according to the Rating Guide. For open-ended questions, credit may be allowed for responses other than those given in the rating guide if the response is a scientifically accurate answer to the question and demonstrates adequate knowledge as indicated by the examples in the rating guide. Do not attempt to correct the student's work by making insertions or changes of any kind. On the student's separate answer sheet, for each question, record the number of credits earned and the teacher's assigned rater/scorer letter.

Fractional credit is *not* allowed. Only whole-number credit may be given for a response. If the student gives more than one answer to a question, only the first answer should be rated. Units need not be given when the wording of the questions allows such omissions.

For hand scoring, raters should enter the scores earned in the appropriate boxes printed on the separate answer sheet. Next, the rater should add these scores and enter the total in the space provided. Then the student's raw score on the test should be converted to a scale score by using the conversion chart that will be posted on the Department's web site at: https://www.nysed.gov/state-assessment/high-school-regents-examinations no later than January 23, 2026. The student's scale score should be entered in the box labeled "Scale Score" on the student's answer sheet. The scale score is the student's final examination score.

Schools are not permitted to rescore any of the open-ended questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.

Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that, for each administration, the conversion chart provided for that administration be used to determine the student's final score.

The test item map on page 11 identifies the Performance Expectation with which each test question is aligned. All NYSP-12SLS Performance Expectations are three-dimensional (https://www.nysed.gov/sites/default/files/programs/standards-instruction/p-12-science-learning-standards.pdf). The integration of these three dimensions provides students with a context for the content of science (DCI), the methods by which science knowledge is acquired and understood (SEP), and the ways in which the sciences are connected through concepts that have universal meaning across the disciplines (CCC).

1 [1] Allow 1 credit for *three* correct responses, as shown below:

Statement 1:	X	energy, predicted by scientists, that is distributed throughout the universe
Statement 2:	X	cooled and then became transparent
Statement 3:	X	galaxies formed in areas of higher density

2 [1] Allow 1 credit for 2.

3 [1] Allow 1 credit for 1.

4 [1] Allow 1 credit for 1.

5 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The greater mass of Betelgeuse causes nucleosynthesis to occur at a faster rate than the Sun.

— The more massive a star, the greater the rate of fusion.

6 [1] Allow 1 credit for indicating *three* correct choices, as shown below:

Statement 1

Evidence for the distribution pattern of the plastic bath toys from the accident location to the northwest coast of North America is provided by

- [ ] the movement of the toys along the Kuroshio Current, followed by movement along the California Current
- [X] the movement of the toys along the North Pacific Current, followed by movement along the Alaska Current

Statement 2

One cause of the global circulation patterns of ocean currents is the

- [X] location and distribution of landmasses
- [ ] distance from the equator

Statement 3

Other than ocean currents, global patterns that contributed to the distribution of the toys were also influenced by atmospheric

- [ ] concentrations of greenhouse gases
- [X] density and heat energy differences

7 [1] Allow 1 credit for 2.

8 [1] Allow 1 credit for 2.

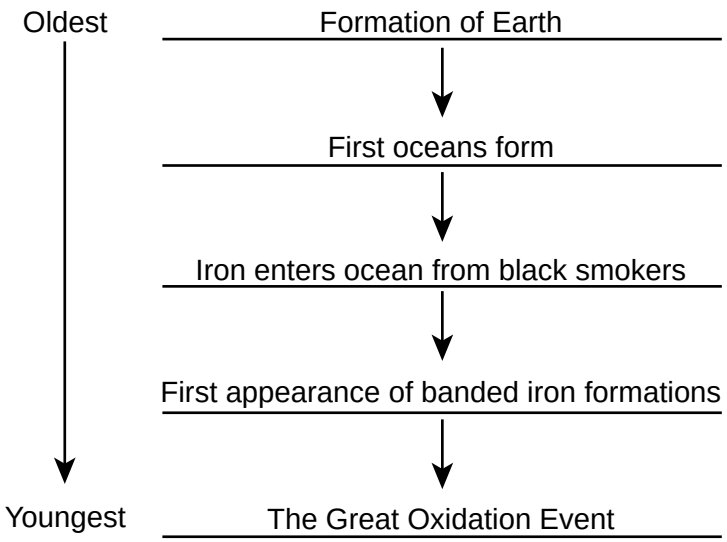
9 [1] Allow 1 credit for 1.

10 [1] Allow 1 credit for 1.

11 [1] Allow 1 credit for 1.

12 [1] Allow 1 credit for 4.

13 [1] Allow 1 credit for the correct order, as shown below:



14 [1] Allow 1 credit for 3.

15 [1] Allow 1 credit for an acceptable response. Acceptable responses include, but are not limited to:

— Humans built highways near limestone and dolostone mines because the crushed stone used to make highways is produced at these mines.

— Limestone and dolostone mines produce the crushed stone used in highway construction. Highways have been built near limestone and dolostone mines because transporting crushed stone is very expensive.

16 [1] Allow 1 credit for selecting all *three* correct choices for these statements, as shown below:

Statement 1: *B*

Statement 2: *D*

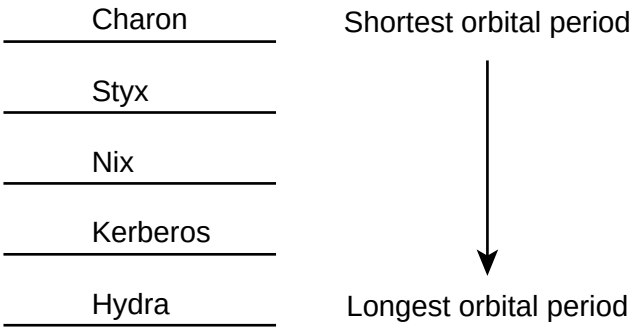
Statement 3: *E*

17 [1] Allow 1 credit for 3.

18 [1] Allow 1 credit for 3.

19 [1] Allow 1 credit for a correctly-completed list, as shown below, *and* an acceptable justification.

List of Moons



Acceptable justifications include, but are not limited to:

— According to one of Kepler's laws, objects orbiting at a greater distance have a longer period of revolution.

— In order to sweep out equal area in equal time, moons travel faster when closer to a planet, causing a shorter orbital period for moons that are closer.

20 [1] Allow 1 credit for 4.

21 [1] Allow 1 credit for 3.

22 [1] Allow 1 credit for selecting Support *and* an acceptable justification. Acceptable justifications include, but are not limited to:

— Charon's orbital period is 6.4 Earth days and its rotational period is also 6.4 Earth days.

— Charon's orbital period and rotational period are the same.

23 [1] Allow 1 credit for 2.

24 [1] Allow 1 credit for 3.

25 [1] Allow 1 credit for 3.

26 [1] Allow 1 credit for 4.

27 [1] Allow 1 credit for Atmosphere *and* an acceptable explanation. Acceptable explanations include, but are not limited to:

— The Eurostar uses 6 g/km of carbon per person; the ferries use 19 g/km of carbon.

— Short-haul flights release 249 g/km more carbon into the atmosphere compared to the Eurostar train.

Note: Do *not* accept explanations without numerical values.

28 [1] Allow 1 credit for 2.

29 [1] Allow 1 credit for an acceptable response. Acceptable responses include, but are not limited to:

— As the ice mass decreased, it caused the hydrosphere (ocean) sea level to increase because the ice melted due to an increase in temperature.

— When ice mass decreased on the continent, it created a feedback by increasing sea level measurements around the continent for the same time period because ice probably melted into the ocean.

— When ice melted, fresh water entered the ocean, causing the salinity to drop.

30 [1] Allow 1 credit for 1.

31 [1] Allow 1 credit for *three* correct choices, as shown below:

Statement 1: ___*A*___

Statement 2: ___*D*___

Statement 3: ___*H*___

32 [1] Allow 1 credit for 4.

33 [1] Allow 1 credit for 3.

34 [1] Allow 1 credit for 4.

35 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Bennu and Earth must be in the same place when/where their orbits cross.

— The celestial objects must meet when/where their paths intersect.

36 [1] Allow 1 credit for 2.

37 [1] Allow 1 credit for correctly placing check marks in *all* of the rows, as shown below:

Criteria/Constraint	Options 1 and 2 (DART/Nuclear)	Option 3 (Yarkovsky Effect)
Occurs Continuously		✓
Solar Radiation		✓
Risk of Debris Striking Earth	✓	
Causes Rapid Change in Orbit	✓	

Note: Allow credit if a symbol other than a check mark is used.

38 [1] Allow 1 credit for correctly checking sandstone *and* acceptable evidence. Acceptable evidence includes, but is not limited to:

— A sandstone layer is at the top of each waterfall, so it must be more resistant to weathering and erosion.

— The sandstone layers extend farther out in the rock column compared to the shale.

— The shale shows more erosional cutback than the sandstone.

39 [1] Allow 1 credit for 1.

40 [1] Allow 1 credit for 4.

41 [1] Allow 1 credit for 2.

42 [1] Allow 1 credit for *both* a negative effect and a resulting change to one Earth system. Acceptable responses include, but are not limited to:

Negative Effect	Resulting Change to One Earth System
— Land must be cleared/deforested to dig a mine.	— When land is cleared, more erosion of the geosphere occurs. — When land is deforested, the biodiversity of the biosphere is reduced/eliminated.
— Mine wastes (tailings) are stored on the surface, which causes pollution.	— Precipitation dissolves materials in the mine waste, which infiltrates to groundwater, polluting it. — Materials from the piles of tailings become airborne and can be harmful to people as air pollution.

43 [1] Allow 1 credit for 3.

44 [1] Allow 1 credit for 4.

45 [1] Allow 1 credit for 2.

46 [1] Allow 1 credit for 3.

47 [1] Allow 1 credit for *both* a correct atmospheric composition and surface temperature. Acceptable responses include, but are not limited to:

Change in atmospheric composition:

— decreased carbon dioxide/CO_2 levels

— lower levels of the greenhouse gas carbon dioxide/CO_2

— oxygen levels/O_2 increased

Change in surface temperature:

— Earth's surface temperature decreased

— the temperature was lower/cooler

48 [1] Allow 1 credit for an acceptable response. Acceptable responses include, but are not limited to:

— Dragonflies living 200 million years ago would have a smaller wingspan because oxygen levels were approximately 15%.

— The oxygen levels were lower at that time, and dragonflies would most likely have a smaller wingspan than modern dragonflies.

49 [1] Allow 1 credit for 1.

50 [1] Allow 1 credit for 4

The *Chart for Determining the Final Examination Score for the January 2026 Regents Examination in Earth and Space Sciences* will be posted on the Department's web site at: https://www.nysed.gov/state-assessment/high-school-regents-examinations. Conversion charts provided for previous administrations of the Regents Examination in Earth and Space Sciences must NOT be used to determine students' final scores for this administration.

Online Submission of Teacher Evaluations of the Test to the Department

Suggestions and feedback from teachers provide an important contribution to the test development process. The Department provides an online evaluation form for State assessments. It contains spaces for teachers to respond to several specific questions and to make suggestions. Instructions for completing the evaluation form are as follows:

1. Go to https://www.nysed.gov/state-assessment/teacher-feedback-state-assessments.
2. Click Regents Examinations.
3. Complete the required demographic fields.
4. Select the test title from the Regents Examination dropdown list.
5. Complete each evaluation question and provide comments in the space provided.
6. Click the SUBMIT button at the bottom of the page to submit the completed form.

THE STATE EDUCATION DEPARTMENT

THE UNIVERSITY OF THE STATE OF NEW YORK / ALBANY, NY 12234

January 2026 Earth and Space Sciences Test Item Map to the Standards

Question	Type	Points	Performance Expectation
1	Constructed Response	1	HS-ESS1-2
2	Multiple Choice	1	HS-ESS1-2
3	Multiple Choice	1	HS-ESS1-2
4	Multiple Choice	1	HS-ESS1-3
5	Constructed Response	1	HS-ESS1-3
6	Constructed Response	1	HS-ESS2-8
7	Multiple Choice	1	HS-ESS2-8
8	Multiple Choice	1	HS-ESS3-3
9	Multiple Choice	1	HS-ESS3-2
10	Multiple Choice	1	HS-ESS2-7
11	Multiple Choice	1	HS-ESS1-6
12	Multiple Choice	1	HS-ESS2-2
13	Constructed Response	1	HS-ESS2-1
14	Multiple Choice	1	HS-ESS2-3
15	Constructed Response	1	HS-ESS3-1
16	Constructed Response	1	HS-ESS3-4
17	Multiple Choice	1	HS-ESS3-2
18	Multiple Choice	1	HS-ESS3-4
19	Constructed Response	1	HS-ESS1-4
20	Multiple Choice	1	HS-ESS1-4
21	Multiple Choice	1	HS-ESS1-7
22	Constructed Response	1	HS-ESS1-7
23	Multiple Choice	1	HS-ESS1-6
24	Multiple Choice	1	HS-ESS2-2
25	Multiple Choice	1	HS-ESS2-1
26	Multiple Choice	1	HS-ESS1-6
27	Constructed Response	1	HS-ESS3-6
28	Multiple Choice	1	HS-ESS3-5
29	Constructed Response	1	HS-ESS2-2
30	Multiple Choice	1	HS-ESS3-5
31	Constructed Response	1	HS-ESS2-4
32	Multiple Choice	1	HS-ESS3-5
33	Multiple Choice	1	HS-ESS1-4
34	Multiple Choice	1	HS-ESS1-6
35	Constructed Response	1	HS-ESS1-4
36	Multiple Choice	1	HS-ESS1-4
37	Constructed Response	1	HS-ETS1-3
38	Constructed Response	1	HS-ESS2-5
39	Multiple Choice	1	HS-ESS3-1
40	Multiple Choice	1	HS-ESS2-5
41	Multiple Choice	1	HS-ETS1-4
42	Constructed Response	1	HS-ESS2-2
43	Multiple Choice	1	HS-ESS3-2
44	Multiple Choice	1	HS-ESS3-1
45	Multiple Choice	1	HS-ESS3-1
46	Multiple Choice	1	HS-ESS2-7
47	Constructed Response	1	HS-ESS2-2
48	Constructed Response	1	HS-ESS2-7
49	Multiple Choice	1	HS-ESS2-7
50	Multiple Choice	1	HS-ESS2-6

The State Education Department / The University of the State of New York

Regents Examination in Earth and Space Sciences – JANUARY 2026

Chart for Converting Total Test Raw Scores to Final Exam Scores (Scale Scores)

(Use for the January 2026 exam only.)

Raw Score	Scale Score	Performance Level
50	**100**	5
49	**99**	5
48	**98**	5
47	**96**	5
46	**95**	5
45	**94**	5
44	**92**	5
43	**91**	5
42	**89**	5
41	**88**	5
40	**87**	5
39	**85**	5
38	**84**	4
37	**82**	4
36	**81**	4
35	**79**	4
34	**78**	4

Raw Score	Scale Score	Performance Level
33	**77**	4
32	**75**	3
31	**74**	3
30	**73**	3
29	**71**	3
28	**70**	3
27	**69**	3
26	**68**	3
25	**66**	3
24	**65**	3
23	**64**	2
22	**62**	2
21	**61**	2
20	**59**	2
19	**58**	2
18	**56**	2
17	**55**	2

Raw Score	Scale Score	Performance Level
16	**53**	1
15	**51**	1
14	**48**	1
13	**46**	1
12	**44**	1
11	**41**	1
10	**38**	1
9	**35**	1
8	**32**	1
7	**29**	1
6	**25**	1
5	**21**	1
4	**17**	1
3	**13**	1
2	**9**	1
1	**4**	1
0	**0**	1

To determine the student's final examination score (scale score), find the student's total test raw score in the column labeled "Raw Score" and then locate the scale score that corresponds to that raw score. The scale score is the student's final examination score. Enter this score in the space labeled "Scale Score" on the student's answer sheet.

Schools are not permitted to rescore any of the open-ended questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.

Because scale scores corresponding to raw scores in the conversion chart change from one administration to another, it is crucial that for each administration the conversion chart provided for that administration be used to determine the student's final score. The chart above is usable only for this administration of the Regents Examination in Earth and Space Sciences.