

**JD's** REGENTS PREPARATION, LLC.

**-Presents-**

# **Earth and Space Sciences**

## **REVIEW MANUAL**

**WITH 6 REGENTS EXAMS,  
4 TOPICALLY ORGANIZED**

**SPECIAL EDITION**

*Each Question Linked is  
to a Solution Video*

*QR Coded for One to One Initiative*



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# Earth and Space Sciences

## Review

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# REFERENCE TABLES FOR PHYSICAL SETTING EARTH SCIENCE 2011 EDITION



The use of this reference may be helpful for answering the questions in Units 1 through 7.

The new  
2024 NGLS Earth and Space Sciences  
Reference Tables  
can be found in the back of the book.



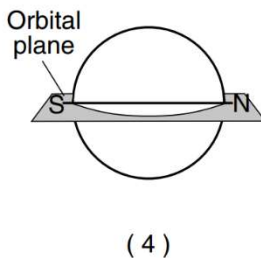
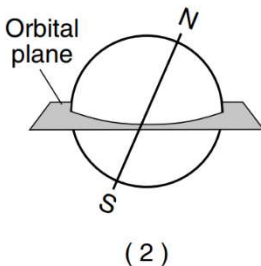
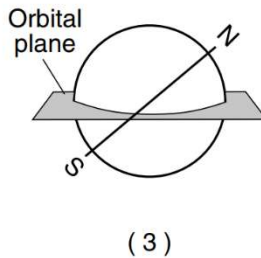
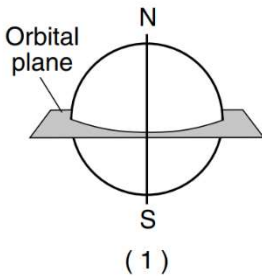
# The Development of the Heliocentric Model

1. The best evidence of Earth's rotation is provided by the
  - (1) Foucault pendulum and global warming
  - (2) Foucault pendulum and Coriolis effect
  - (3) Moon phases and global warming
  - (4) Moon phases and Coriolis effect
  
2. Which diagram best represents Earth's axis position relative to Earth's orbital plane?

08 17 03



08 17 26



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The Development of the Heliocentric Model

3. In 1851, French physicist Léon Foucault used a swinging pendulum to demonstrate that Earth
- (1) is rotating
  - (2) is revolving
  - (3) has a curved surface
  - (4) has a gravitational pull

06 18 04



4. Which equation is used to determine the approximate rate of Earth's revolution?

08 18 30



(1) Approximate rate of Earth's revolution =  $\frac{365^\circ}{360 \text{ days}}$

(2) Approximate rate of Earth's revolution =  $\frac{360^\circ}{24 \text{ hours}}$

(3) Approximate rate of Earth's revolution =  $\frac{360^\circ}{365 \text{ days}}$

(4) Approximate rate of Earth's revolution =  $\frac{24^\circ}{360 \text{ hou}}$

# Heliocentric Earth Models and Their Effects

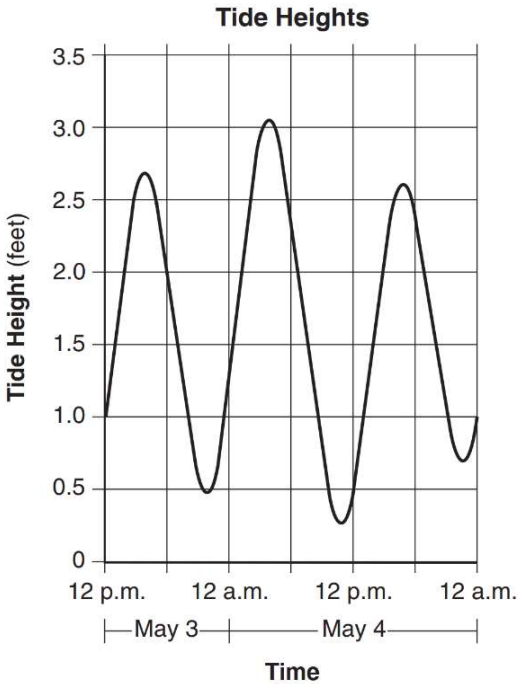
1. During which month does the Sun rise north of due east in New York State?
  - (1) February
  - (2) July
  - (3) October
  - (4) December

06 17 07



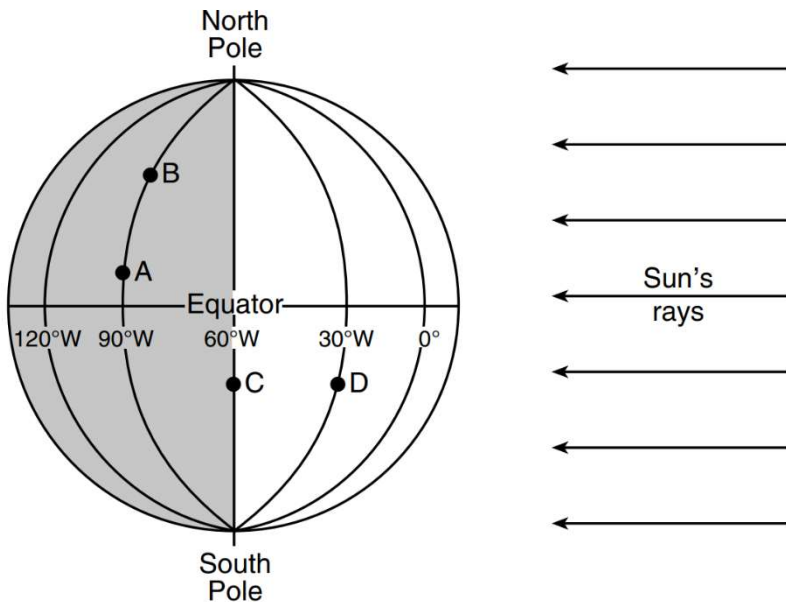
2. The graph below shows the change in tide heights of the Hudson River at Newburgh, New York.

06 17 08



Base your answers to questions 2 through 4 on the diagram below and on your knowledge of Earth science. The diagram represents Earth on the first day of a season. The equator, several lines of longitude, and the North and South Poles have been labeled. Letters *A* through *D* represent locations on Earth's surface.

08 17 66-68



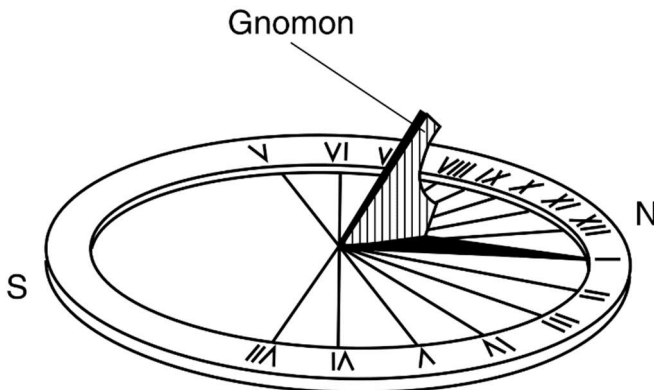
2. Identify *one* possible date that is represented by the position of Earth in this diagram
3. State whether the relative altitude of *Polaris* at location *A* is lower or higher than at location *B*. Explain why this difference is observed.

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Our System of Time

4. State the solar time at location *D* if the solar time at location *C* is 6:00 a.m. Indicate a.m. or pm. in your answer.

The diagram below represents a sundial positioned in New York State. During daylight, the shadow cast by the gnomon (pointer) moves across the disc, with the tip of the shadow pointing to the time of day.

08 18 01

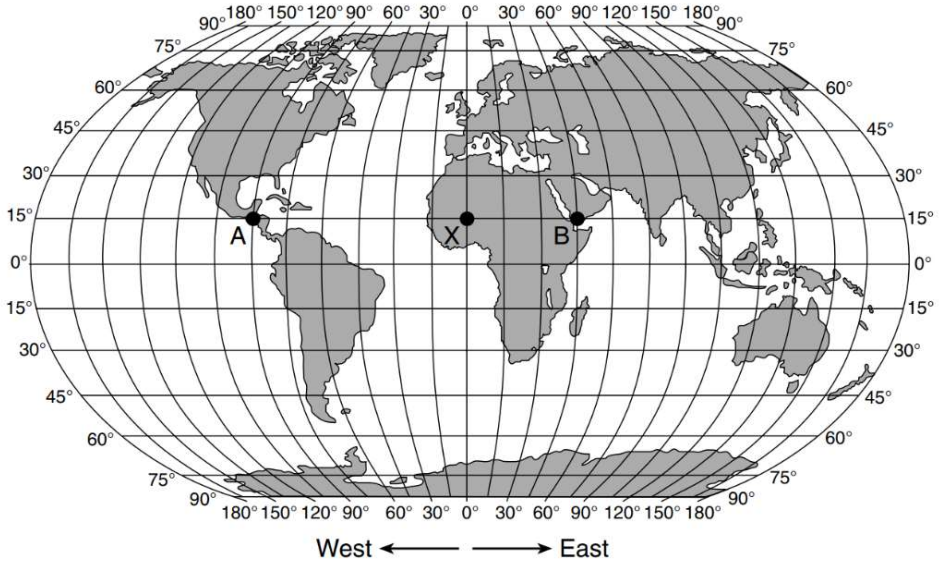


This motion of the gnomon's shadow on the sundial is mainly due to

- (1) Earth's rotation
- (2) Earth's revolution
- (3) the Sun's rotation
- (4) the Sun's revolution

6. The map below shows three locations, labeled A, X, and B, on Earth's surface.

08 18 29



Which table correctly indicates the solar times at locations A and B when it is 12 noon at location X?

Location	Solar Time
A	6 a.m.
B	9 a.m.

( 1 )

Location	Solar Time
A	6 p.m.
B	9 a.m.

( 3 )

Location	Solar Time
A	6 a.m.
B	3 p.m.

( 2 )

Location	Solar Time
A	6 p.m.
B	3 p.m.

( 4 )

Base your answers to questions 7 through 10 on the passage, chart of definitions and photograph on the next page, and on your knowledge of Earth science. The passage is an excerpt from the 1994 novel *Inca Gold*, by Clive Cussler, which describes the formation of a sinkhole in the Andes Mountains of South America. The chart of definitions helps the reader understand some concepts in the passage. The photograph shows a sinkhole that formed in a South American village.

08 18 55-58



**Excerpt from *Inca Gold***

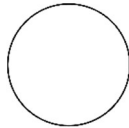
...The sinkhole's early history began in the Cambrian era when the region was part of an ancient sea. Through the following geological eras, thousands of generations of shellfish and coral lived and died, their skeletal carcasses forming an enormous mass of lime and sand that compressed into a limestone and dolomite layer two kilometers thick. Then, beginning sixty-five million years ago, an intense earth uplifting occurred that raised the Andes Mountains to their present height. As the rain ran down from the mountains it formed a great underground water table that slowly began dissolving the limestone. Where it collected and pooled, the water ate upward until the land surface collapsed and created the sinkhole....

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The Origins of Earth and its Moon

6. The diagram below represents the appearance of the Moon at phase 3 as seen by an observer in New York State.



In the circle below, shade the part of the Moon that appears dark to an observer in New York State when the Moon is at phase 7.



### **Supermoon Eclipse**

On September 27, 2015, a rare total lunar eclipse of a supermoon occurred. A supermoon occurs when the entire lighted half of the Moon faces Earth (full Moon phase) and the Moon is at its closest point to Earth in its orbit. At this time, the Moon will appear 14% larger and 30% brighter than normal. Supermoon events are rare, but a total lunar eclipse during a supermoon is even more rare. There have been only six total supermoon lunar eclipses since 1900. The next one will not happen until 2033.

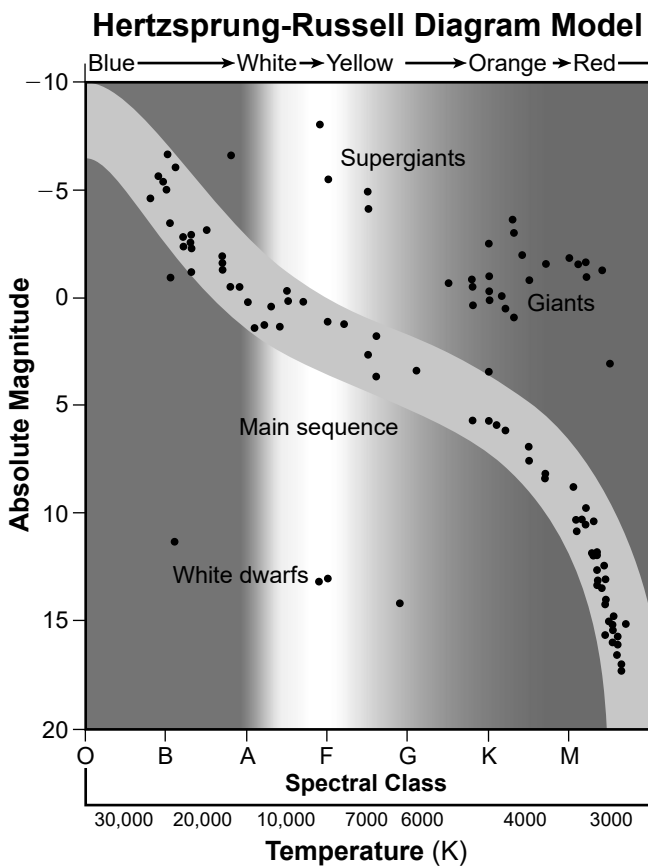
**EARTH AND SPACE SCIENCES**  
**June 2025**

Answer all questions in this part.

**Directions** Use your knowledge of Earth and Space Sciences to answer all questions in this examination. Throughout this exam, some questions may require the use of the *2024 Edition Reference Tables for Earth and Space Sciences*. This is provided in the back of this review book. Note that diagrams are not drawn to scale unless otherwise noted.

**Our Sun – A Star**

The Hertzsprung-Russell (H-R) diagram was developed from star charts by two scientists in different countries independently of each other in 1911. It classified stars based on their surface temperatures, observable color, and magnitude. Absolute magnitude is a measurement of how bright a star would appear if all stars are the same distance from Earth. The brighter the star, the lower the absolute magnitude value.



1. Our Sun is classified as a spectral class G star with a surface temperature between 5000 to 6000 K and an absolute magnitude of about five. Based on this information, complete the H-R diagram model by placing **one X** to indicate where the Sun is located. Also, identify the relative temperature and relative absolute magnitude of the Sun as it transitions to a red giant.

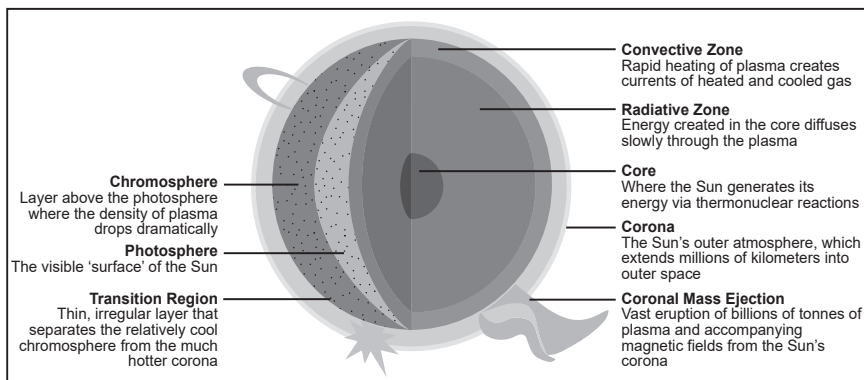


Change in relative temperature: \_\_\_\_\_

Change in relative absolute magnitude: \_\_\_\_\_

The model below shows the layers of the Sun and information about some features of each layer.

**Model of Sun's Layers**



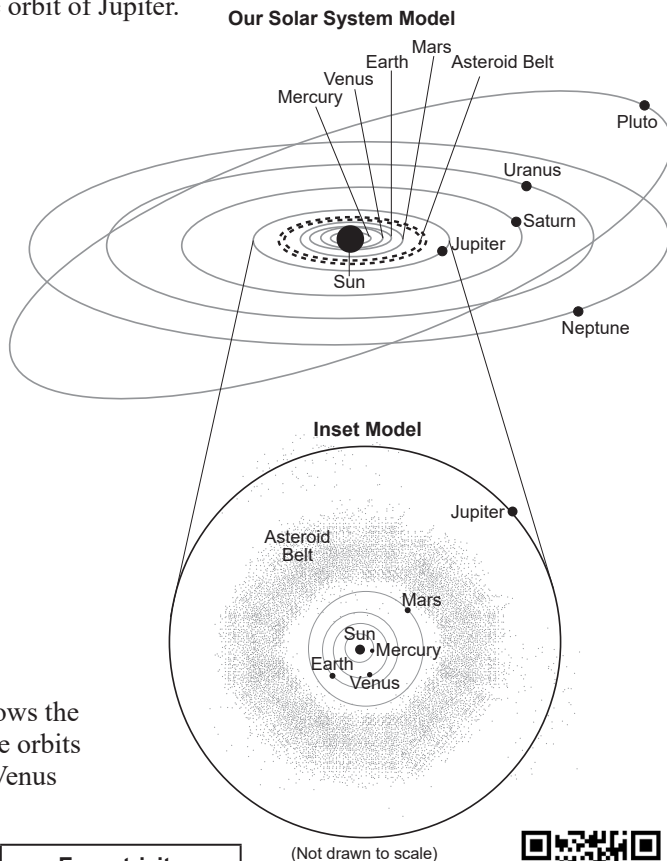
(Not drawn to scale)

2. Based on the information in the model, which list of five of the Sun's layers are in the correct sequence to allow energy generated by fusion to eventually reach the Sun's surface as radiation?



- (1) core → chromosphere → photosphere → transition region → corona
- (2) core → radiative zone → transition region → photosphere → corona
- (3) core → photosphere → corona → transition region → chromosphere
- (4) core → radiative zone → convective zone → photosphere → chromosphere

The model below represents the orbits of celestial bodies around our Sun. The inset model shows some information about the region of the solar system inside the orbit of Jupiter.



3. The table shows the eccentricity of the orbits of Mercury and Venus around the Sun.

Planet	Eccentricity
Mercury	0.206
Venus	0.007



Place a check mark ( $\checkmark$ ) in the boxes to indicate the **two** statements that are correctly predicted by Kepler's Laws.

- Venus orbits the Sun at a constant speed.
- Mercury travels faster in its orbit when it is closer to the Sun.
- Venus's orbit is less elliptical than Mercury's orbit.
- The orbital speeds of both planets are affected by their masses.
- Unlike Venus, the eccentricity of Mercury's orbit prevents Mercury from having a moon.

4. Based on the *Our Solar System Model*, if a new planet was identified that orbited the Sun at an average orbital distance greater than that of Mercury but less than that of Venus, the average speed of this planet would be

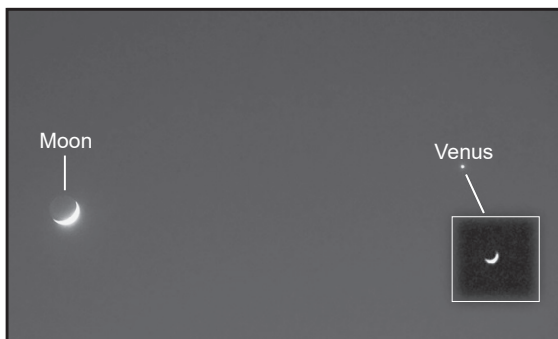


- (1) greater than the average speed of Mercury, but less than the average speed of Venus
- (2) less than the average speed of Mercury, but greater than the average speed of Venus
- (3) greater than the average speed of Venus, but less than the average speed of Earth
- (4) less than the average speed of Venus, but greater than the average speed of Earth

An observer on Earth sees phases of the Moon, but the Moon isn't the only solar system body to exhibit phases. Venus also has observable phases as viewed from Earth. Venus's orbit around the Sun is approximately 225 Earth days.

**Observed Phases of the Moon and Venus**

The photograph shows a Moon phase and Venus viewed with unaided eyes in the night sky. The inset box shows Venus observed using a telescope. Both the Moon and Venus are in crescent phase.



5. Using *Our Solar System Model*, construct an explanation for why an observer on Earth can see a cycle of phases for the planet Venus. In the spaces below, write the terms for choices *A*, *B*, and *C* that correctly complete the passage.



**Choices A:**

- inside
- outside

**Choices B:**

- closer to
- farther from

**Choices C:**

- Moon
- Sun

Venus orbits the Sun, circling   A   Earth's orbit in about 225 Earth days. This means that Venus is sometimes   B   Earth, while at other times it is positioned on the other side of the   C  . It is this change in relative positions of Venus that causes an observer on Earth to see phases of Venus.

Choice *A*: \_\_\_\_\_ Choice *B*: \_\_\_\_\_ Choice *C*: \_\_\_\_\_

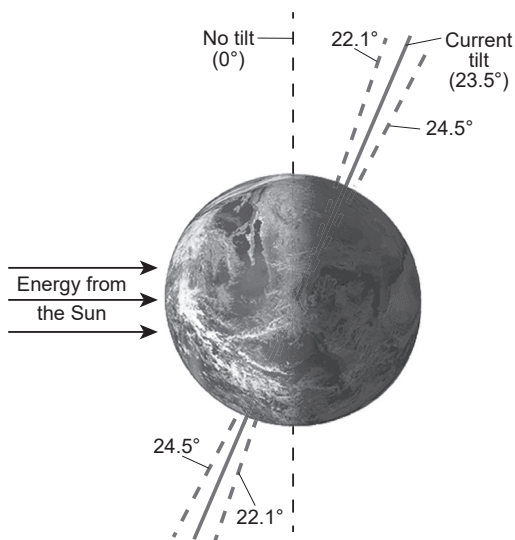
Base your answers to questions 6 through 10 on the information below and on your knowledge of Earth and Space Sciences. Some questions may require the use of the *2024 Edition Reference Tables for Earth and Space Sciences*.

### Modeling Earth Systems to Understand Global Climate

The geologic record shows a long history of climate fluctuations as a result of many different factors. Climate scientists study models of Earth's motions, ocean currents, plate tectonic movement, and atmospheric composition to better understand energy flow into and out of Earth's systems.

Obliquity, the tilt of Earth's axis relative to the Sun, has a direct impact on Earth's climate. Earth's obliquity changes on a cycle that takes place over a period of 41,000 years. The obliquity is currently decreasing and will reach its minimum value of  $22.1^\circ$  in approximately 9800 years.

#### Maximum and Minimum Angles of Obliquity



6. During winter, which statement best describes the amount of energy Earth's northern hemisphere will receive and the impact on global ice formation when the obliquity is  $22.1^\circ$ , compared to Earth's present obliquity?

- (1) Earth's northern hemisphere will receive less energy, and less ice will form in polar regions.
- (2) Earth's northern hemisphere will receive less energy, and more ice will form in polar regions.
- (3) Earth's northern hemisphere will receive more energy, and less ice will form in polar regions.
- (4) Earth's northern hemisphere will receive more energy, and more ice will form in polar regions.

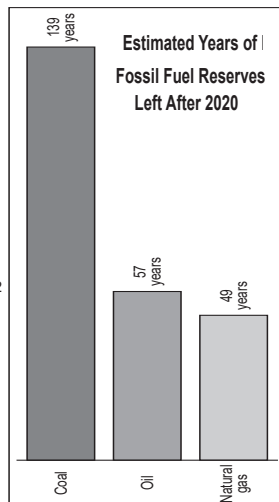
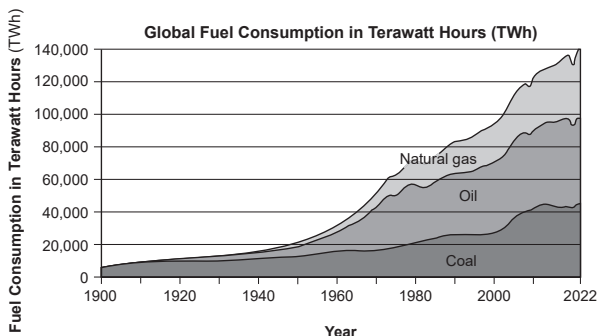


41. Based on the information from *Simulation 1* and *Simulation 2*, which row in the table below correctly matches both a method of managing natural resources and the resulting effect on human population, greenhouse gases in the atmosphere, and biodiversity beginning in 2020?



Row	Method of Managing Natural Resources	Effect on Human Population	Amount of Greenhouse Gases in Atmosphere	Effect on Biodiversity
(1)	replanting forests	positive	decrease	positive
(2)	replanting forests	positive	no change	negative
(3)	decreasing deforestation	positive	no change	positive
(4)	decreasing deforestation	positive	decrease	negative

The graphs show some information about different types of fossil fuels.



42. Based on the information in both graphs, which statement correctly identifies the relationship between the management of fossil fuels since 1950 and the future sustainability of these resources?



- (1) The yearly consumption of fossil fuels has increased by more than six times and the production of some types of these resources is not sustainable beyond the year 2150.
- (2) The yearly consumption of fossil fuels has increased by more than ten times and the production of some types of these resources is sustainable beyond the year 2170.
- (3) The yearly consumption of fossil fuels has doubled and the production of some types of these resources is sustainable for the next 30 years.
- (4) The yearly consumption of fossil fuels has tripled and the production of some types of these resources is not sustainable for the next 30 years.

The table shows some information about arable land from 1961 to 2016. Arable land is land that can be used for growing crops and supporting livestock.

**World Arable Land per Person 1961 to 2016**

Year	Hectares of Arable Land per Person (1 hectare = 2.47 acres)
1961	0.36
1972	0.3
1983	0.26
1994	0.25
2005	0.21
2016	0.19

43. Based on the graphs and table, which statement correctly provides evidence to support the claim that increased consumption of fossil fuels caused a change in the amount of world arable land per person?



- (1) Atmospheric temperature increased, which increased soil evaporation and increased the amount of arable land.
- (2) Atmospheric temperature increased, which decreased soil evaporation and decreased the amount of arable land.
- (3) Atmospheric temperature increased, which decreased soil evaporation and increased the amount of arable land.
- (4) Atmospheric temperature increased, which increased soil evaporation and decreased the amount of arable land.

The Cheetah Conservation Fund (CCF) is a non-profit organization that is working to ensure the survival of the cheetah and its habitat in Namibia, Africa. The central part of this African country was once a mixed woodland savannah. However, overgrazing by livestock (cattle raised for meat), hunting of elephants and rhinos, and removal of mature trees has changed the landscape to be dominated by thornbushes. This restricts the ability of animals in this habitat to hunt. CCF harvests these thornbushes to make Bushblok, a miniature log which can be used as a biomass fuel source.

44. Describe how the manufacturing of Bushblok logs addresses a problem in Namibia. Explain how these logs benefit the cheetah population and reduce the impact of human activity on cheetah habitat in Namibia.



Problem: \_\_\_\_\_  
Benefit: \_\_\_\_\_

45. Increasing the use of biomass is one of many actions that the CCF is taking to reduce the rate of climate change. Which additional solution, if *increased*, could be used along with biomass as another renewable energy source?



- (1) drilling for oil
- (2) mining of natural gas
- (3) use of solar panels
- (4) burning woodland trees

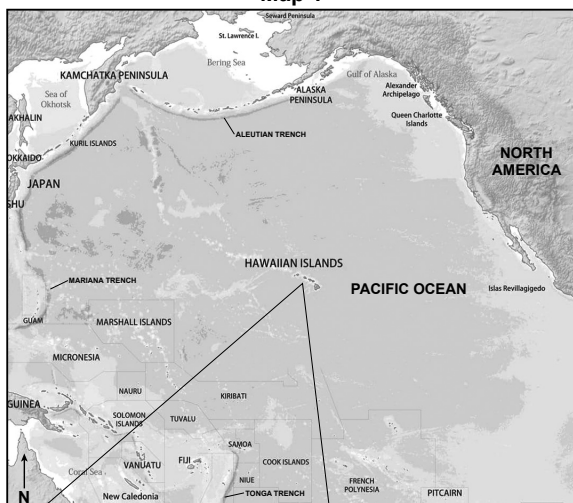
Base your answers to questions 46 through 50 on the information and map below, and on your knowledge of Earth and Space Sciences. Some questions may require the use of the *2024 Edition Reference Tables for Earth and Space Sciences*.

### Tectonics of the Hawaiian Islands

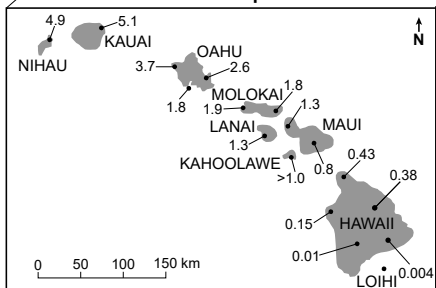
The Hawaiian Islands are situated near the center of the Pacific Plate and are volcanic peaks representing a history of volcanic eruptions. The island of Hawaii is over a hotspot, where a magma source in the mantle pushes upward to Earth's surface creating active volcanoes. The island of Hawaii itself is still being formed by ongoing volcanic activity at Mauna Loa and Kilauea volcanoes, both of which are currently situated over the hotspot. Loihi, an undersea volcano, also sits above the hotspot and will likely become the next Hawaiian island. The other islands in the chain are extinct volcanoes.

The maps show some information about the Hawaiian islands. Varying ages of bedrock on many of the islands are indicated in millions of years. The model shows three stages of island formation over a mantle hotspot.

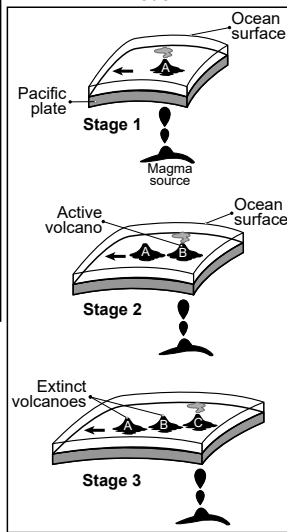
Map 1



Inset Map



Model



(Not drawn to scale)

46. Which table correctly pairs the Earth process with the surface feature that created the Hawaiian Islands chain?



Earth Process	Surface Feature
sinking magma	mid-ocean ridge

(1)

Earth Process	Surface Feature
tectonic uplift	volcanoes

(3)

Earth Process	Surface Feature
rising magma	volcanoes

(2)

Earth Process	Surface Feature
tectonic subduction	oceanic trench

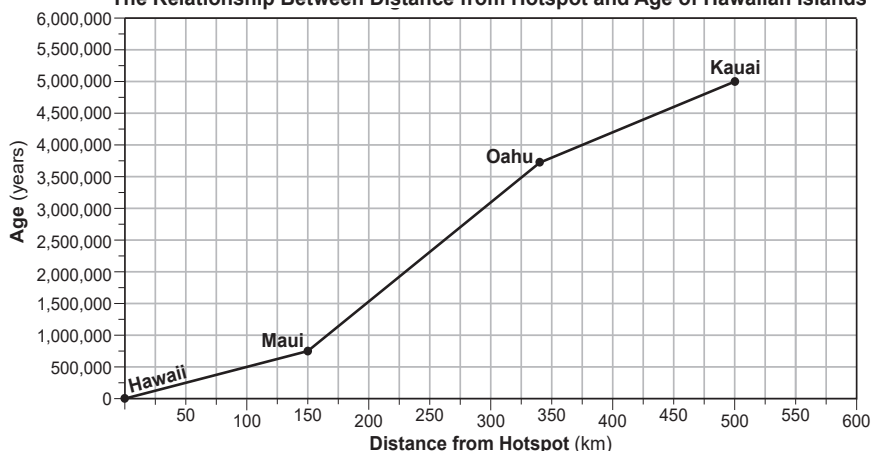
(4)

47. A student makes a claim that the motion of the Pacific Plate can be used to determine the pattern of ages of the Hawaiian Islands. Use evidence from the maps to describe the relationship between the pattern in the ages of the islands and the compass direction that the Pacific Plate is moving.



Pattern in ages: \_\_\_\_\_ Compass direction of movement: \_\_\_\_\_

The Relationship Between Distance from Hotspot and Age of Hawaiian Islands



Two samples of ocean crust were collected between some of the Hawaiian Islands. Data for samples *X* and *Y* is shown below.

Sample	Approximate Age (y)	Approximate Distance (km)
<i>X</i>	500,000	90
<i>Y</i>	2,750,000	275



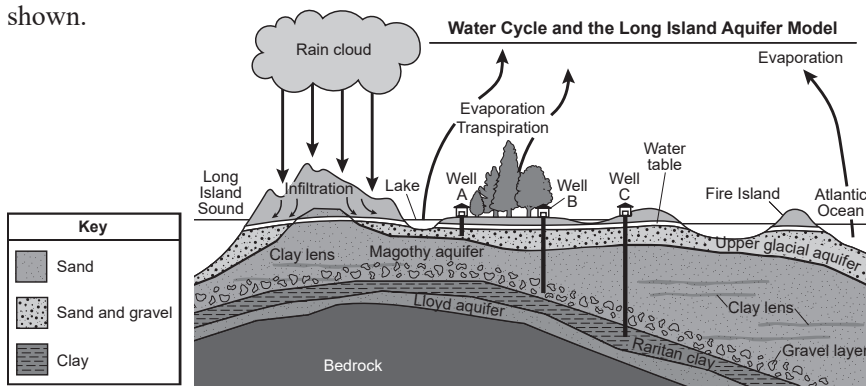
48. Between which islands were the samples collected?

- (1) *X* – between Hawaii and Maui      (3) *X* – between Hawaii and Maui  
*Y* – between Oahu and Kauai      *Y* – between Maui and Oahu
- (2) *X* – between Oahu and Kauai      (4) *X* – between Maui and Oahu  
*Y* – between Hawaii and Maui      *Y* – between Hawaii and Maui

In areas where human population density is high, managing fresh water availability is essential.

A large, underground store of water is called an aquifer. One of the most important aquifers in New York State is beneath Long Island and supplies 400 million gallons of water per day to over 2.8 million people.

The cross section represents water cycle processes for the Long Island area. The three aquifers (Upper Glacial, Magothy, and Lloyd) and sediment or rock layers that together make up the larger Long Island aquifer region are shown.



25. A groundwater investigation is planned for water Well B and Well C from the cross section. A scientist believes that Well B will supply water at a faster rate than Well C. Which statement most likely explains why the scientist is correct?

- (1) The sediments at the base of Well B are less porous with a higher permeability than Well C.
- (2) The sediments at the base of Well B are more porous with a higher permeability than Well C.
- (3) The sediments at the base of Well C are more porous with a lower permeability than Well B.
- (4) The sediments at the base of Well C are less porous with a higher permeability than Well B.



A period of drought occurs when the amount of rainfall an area receives and the amount of precipitation that eventually infiltrates into the ground to reach an aquifer is greatly reduced. When Long Island aquifers experience periods of drought or over-pumping from water wells, salt water from the Atlantic Ocean can intrude into the aquifer, polluting the fresh water.

26. Describe how a prolonged period of drought would affect the depth of the water table. Also, describe how this change would affect residents supplied by water from Well A more than residents supplied by water from Well B.

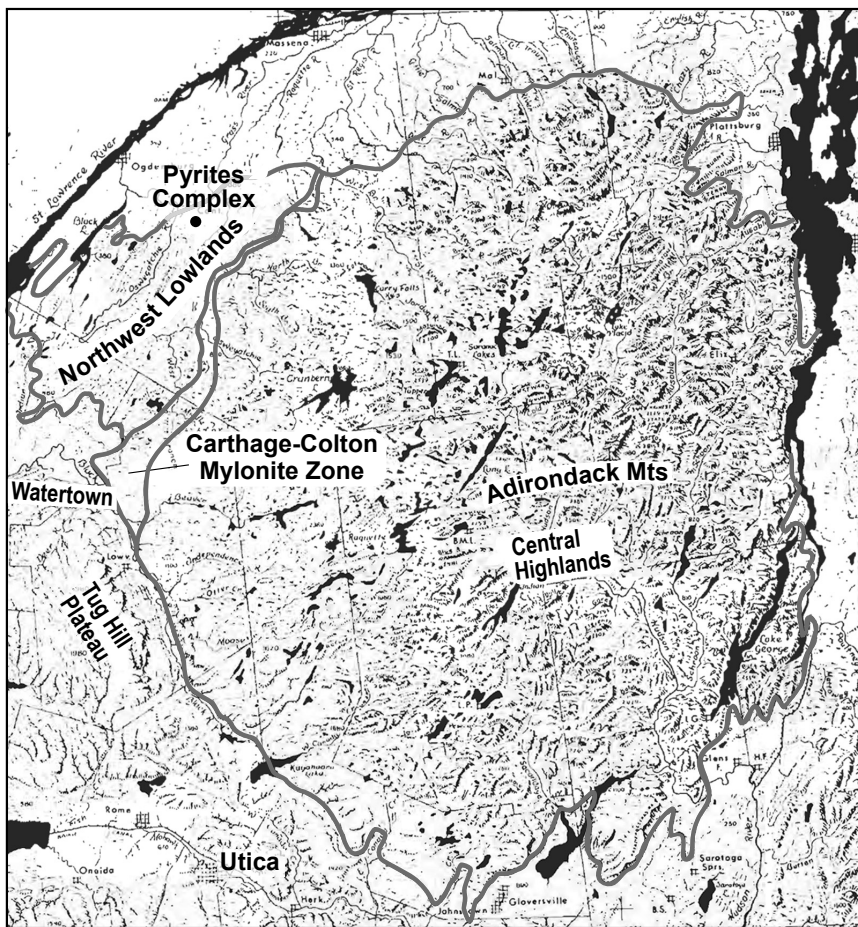
Water table depth:            Effect on Well A and Well B residents:



Base your answers to questions 27 through 30 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.

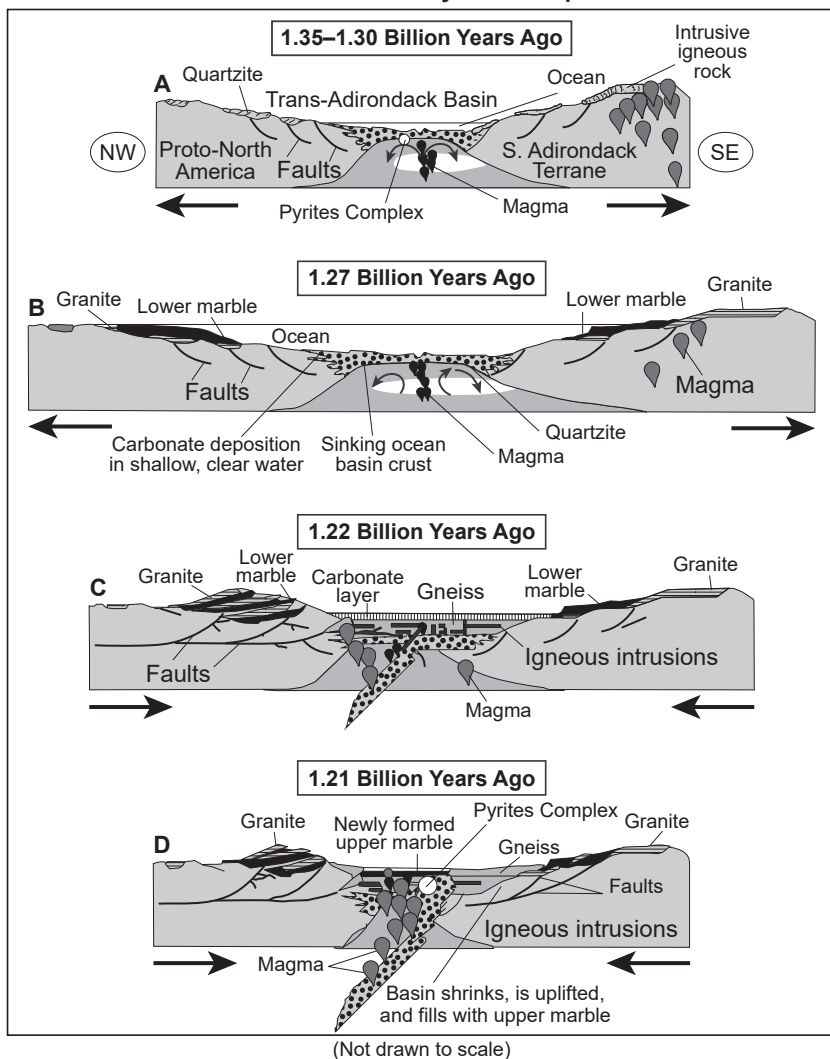
### Northern New York's Pyrites Complex

The Pyrites Complex, located in New York State's Northwest Lowlands, represents a 1.35- to 1.21-billion-year-old fragment of ocean crust and upper mantle rocks. Most of the rocks in the Northwest Lowlands are metamorphosed sedimentary and igneous rocks. The map below shows the location of the Pyrites Complex within the Northwest Lowlands. Bodies of water are shown in black.



Models A, B, C, and D represent the formation of the Pyrites Complex. Arrows indicate the direction of plate motion.

**Formation of the Pyrites Complex**



27. Use **one** of the *Formation of the Pyrites Complex* models to identify **one** geologic process responsible for the cycling of matter that contributed to the formation of the Pyrites Complex. Include the letter of the model in your answer. [1]



Letter of Model: \_\_\_\_ Geologic Process:

28. A student made a chart of constructive and destructive geologic processes from information shown in the *Formation of the Pyrites Complex* models.



Constructive	Destructive
<b>Model B:</b> new ocean crust formed	<b>Model C:</b> subduction of oceanic crust
<b>Model A:</b> intrusive igneous rock rises to the surface	<b>Model D:</b> ocean basin shrinks
<b>Model B:</b> deposition of sediment along ocean basin	<b>Model D:</b> marble is formed from metamorphism of limestone

Which table below shows an additional process that is classified correctly and could be added to the table above?

Constructive
<b>Model A:</b> Trans-Adirondack Basin shrinks

(1)

Constructive
<b>Model C:</b> granite and lower marble are uplifted

(3)

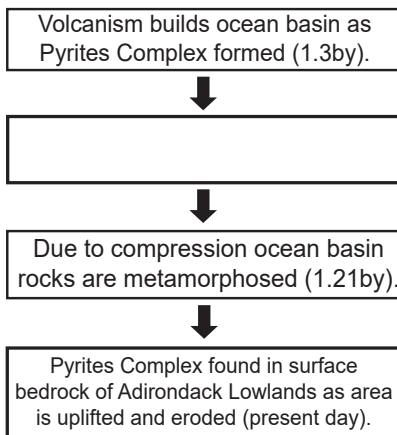
Destructive
<b>Model B:</b> faults first appear along either side of the ocean basin

(2)

Destructive
<b>Model D:</b> basin fills with upper marble

(4)

The flow chart shows four geologic stages that led to the formation of the Pyrites Complex. The second geologic stage was intentionally left blank.



29. Based on evidence from the *Formation of the Pyrites Complex* models, which geologic process correctly identifies

the missing stage in the flow chart above?

- (1) Quartzite is formed from lower marble.
- (2) Ocean floor continues to form and widens.
- (3) Faults move granite beneath the ocean basin.
- (4) Divergence causes the ocean to become narrower and shallower.

The model below pairs tectonic locations with metal deposits that form within them.

**Tectonic Locations Where Mineral and Metal Deposits Form**

<b>Tectonic Settings</b>															
	<table border="1"> <tr> <td style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Metals</b></td> <td>Tin Tungsten Bismuth Copper</td> <td>Copper Zinc Gold Chromium</td> <td>Copper Gold Silver Tin Lead Mercury Molybdenum</td> <td>Lead Zinc Copper</td> <td>Chromium</td> <td>Manganese Cobalt Nickel</td> <td>Copper Zinc</td> </tr> </table>							<b>Metals</b>	Tin Tungsten Bismuth Copper	Copper Zinc Gold Chromium	Copper Gold Silver Tin Lead Mercury Molybdenum	Lead Zinc Copper	Chromium	Manganese Cobalt Nickel	Copper Zinc
	<b>Metals</b>	Tin Tungsten Bismuth Copper	Copper Zinc Gold Chromium	Copper Gold Silver Tin Lead Mercury Molybdenum	Lead Zinc Copper	Chromium	Manganese Cobalt Nickel	Copper Zinc							
<table border="1"> <tr> <td style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Deposits</b></td> <td>Vein: contact metamorphic</td> <td>Volcanogenic massive sulfide, stratabound, evaporites</td> <td>Porphyry copper: veins</td> <td>Stratabound in sediments</td> <td>Magmatic chromite</td> <td>Manganese nodules</td> <td>Volcanogenic massive sulfide</td> </tr> </table>							<b>Deposits</b>	Vein: contact metamorphic	Volcanogenic massive sulfide, stratabound, evaporites	Porphyry copper: veins	Stratabound in sediments	Magmatic chromite	Manganese nodules	Volcanogenic massive sulfide	
<b>Deposits</b>	Vein: contact metamorphic	Volcanogenic massive sulfide, stratabound, evaporites	Porphyry copper: veins	Stratabound in sediments	Magmatic chromite	Manganese nodules	Volcanogenic massive sulfide								

30. Based on the model above, identify the two tectonic settings in which pyrite, a sulfide-based deposit, forms in association with zinc and copper.

- (1) back-arc basin and mid-ocean ridge
- (2) fore-arc basin and magmatic arc
- (3) mid-ocean ridge and granitic plutons in continental crust
- (4) subduction zone and fore-arc basin

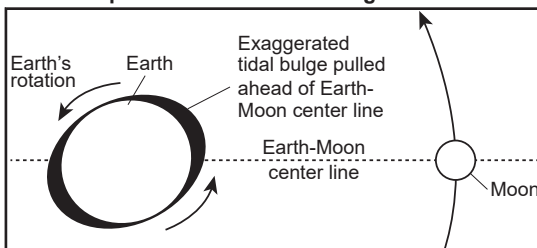


Base your answers to questions 31 through 35 on the information below and the models on the following page.

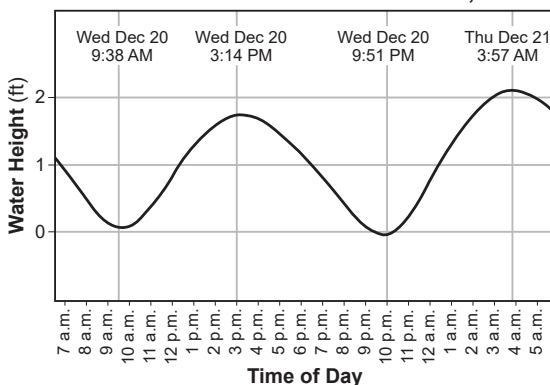
### Earth-Moon History

About four billion years ago, the Moon was very close to Earth, and Earth may have been rotating at a much faster rate than today. It is estimated that each Earth day, at that time, may have been six to eight hours long, which, when calculated, would result in an Earth year of about 1400 days. The force that causes tides on Earth creates tidal friction which, over time, slowed Earth's rotation, causing Earth days to become about 24 hours long. As Earth's rate of rotation has decreased, the Moon has continued to move farther away from Earth at an average rate of 3.8 cm/yr. The Moon orbits Earth at an average distance of 384,400 km. The model and graph below show some information about tides.

Simplified Model of Tidal Bulge on Earth



Observed Tides at Montauk Harbor, NY



31. Which row in the table below correctly identifies the evidence and explanation for the observed cyclic change in tides at Montauk Harbor?



Row	Evidence	Explanation
(1)	change of about two feet in height of water	The Moon's rotation as it orbits Earth causes water level changes.
(2)	change of about two feet in height of water	Earth's revolution around the Sun causes water level changes.
(3)	high tides approximately 12 hours apart	Earth's rotation results in a tidal bulge at a location approximately twice per day.
(4)	high tides approximately 12 hours apart	The Moon's revolution around Earth results in a tidal bulge at a location approximately twice per day.

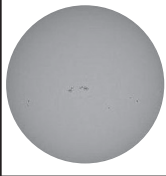



32. Determine, in centimeters, how much farther away from Earth the Moon's average orbit will be 1000 years from the present day, and explain why this change in distance will *not* significantly affect the Moon's period of revolution around Earth.



Distance: \_\_\_\_\_ cm Explanation:

The table below shows some information about the Sun and the Moon.

**Sun and Moon Data**

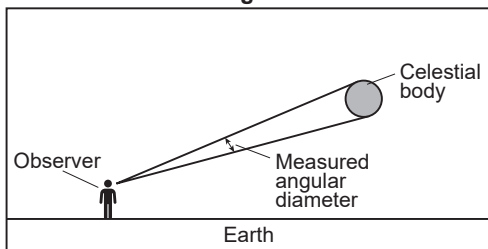
	Sun at Perihelion	Sun at Aphelion	Moon at Perigee	Moon at Apogee
Image of Apparent Size as Viewed from Earth				
Approximate Distance from Earth (km)	147,100,000	152,100,000	363,300	405,500
Approximate Measured Angular Diameter (°)	0.54	0.52	0.56	0.49

33. Construct an explanation to support the claim that in about 700 million years, a total solar eclipse on Earth's surface will be impossible.



The measured angular diameter of a celestial body is the angle that the diameter of the body makes as seen from Earth.

**Measured Angular Diameter**



34. Based on the information in the table, which lettered pair correctly completes the passage below?



The change in the angular diameter of the Moon during the Moon's orbit is   A   than the change in the angular diameter of the Sun during Earth's orbit because the Moon's orbit is inferred to be   B   elliptical than Earth's orbit.

A: smaller	A: greater	A: smaller	A: greater
B: more	B: more	B: less	B: less

(1)

(2)

(3)

(4)

JD's Regents Preparation, LLC – Earth and Space Sciences  
August 2025 – Regents Examination

Astronomers theorize that the Moon formed as a result of a collision between Earth and another planet. The debris created during this collision circulated around Earth and formed the Moon. Evidence for the age of the Moon is found in zircon, a mineral found in lunar rocks. This mineral contains uranium-238.

The table shows some information about four rock samples taken from the lunar surface.

**Lunar Samples and Percent of Uranium Remaining**

Sample	Location	Percent of Uranium Remaining
A	Highland Crust	49.31
B	Lunar Mare	79.25
C	Oceanus Procellarum	73.33
D	Imbrium Basin	61.83

35. Using the table, identify the letter of the sample that provides evidence to support the claim that the Moon is approximately 4.53 billion years old. Explain how this evidence supports the claim.



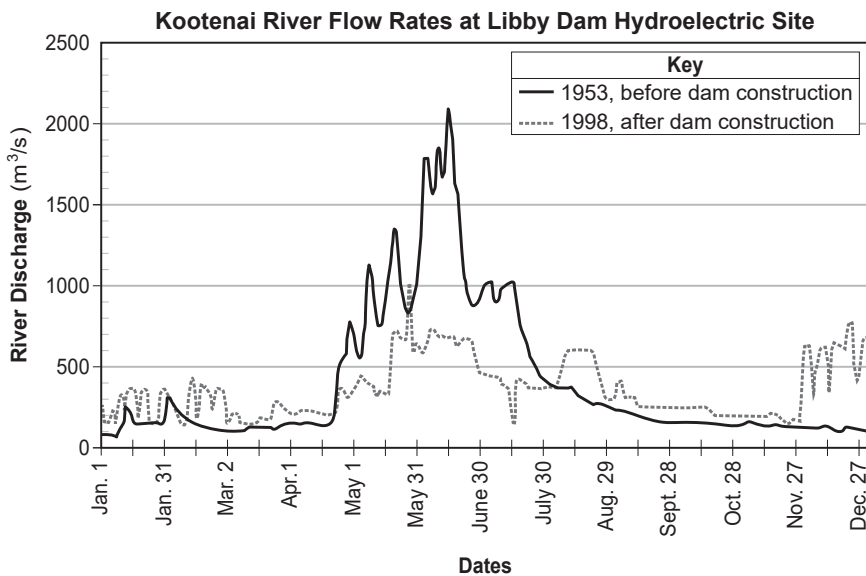
Sample: \_\_\_\_\_ Explanation:

Base your answers to questions 36 through 40 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*.

### Dams and Flood Mitigation

Dams and other structures are often put in place in river systems to help reduce life and property losses to residents living near rivers due to flooding. Dams are also built to generate electricity.

The graph shows river flow rates on the Kootenai River in Montana in cubic meters per second ( $\text{m}^3/\text{s}$ ).



36. Which claim identifies a benefit of developing and managing the Libby Dam Hydroelectric Project after its construction?

- (1) The river flow rates have increased for the entire year, increasing the amount of electricity generated.
- (2) The river flow rates have decreased during the winter months, increasing the amount of electricity generated.
- (3) After dam construction, the river flow rates changed less throughout the year and allowed for more control of electric generation.
- (4) After dam construction, the river flow rates changed more throughout the year and allowed for more control of electric generation.

