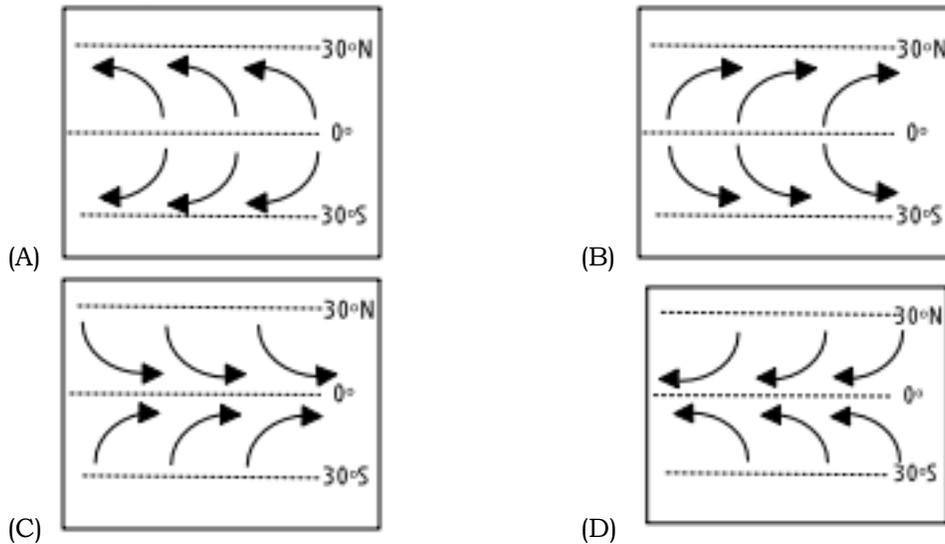


Earth/Env. Science Practice Exam

Which map best shows the surface movement of winds between 30°N and 30°S latitude?



Which of the following is associated with mid-ocean ridges?

- (A) extreme temperatures
- (B) mountainous topography
- (C) volcanic structures
- (D) rift valleys

Which of the following is NOT a major source of groundwater pollution?

- (A) compost
- (B) pesticides
- (C) sewage
- (D) industrial chemicals

What is the most abundant salt in the sea?

- (A) potassium chloride
- (B) calcium chloride
- (C) magnesium chloride
- (D) sodium chloride

Renewable resources

- (A) include iron, natural gas, and copper
- (B) have finite supplies that will one day be used up
- (C) can be replenished over months, years, or decades
- (D) are all living resources

Which of the following is the result of chemical weathering?

- (A) a rock that has been changed into one or more new compounds
- (B) a rock that has been broken into tiny pieces
- (C) a rock that has lost its outer layers
- (D) a rock that has been split in two

What is one of the drawbacks to the extensive use of solar energy?

- (A) It produces toxic pollution.
- (B) It is available only at night.
- (C) It is nonrenewable.
- (D) Necessary equipment and installation are expensive.

What is the source of geothermal energy?

- (A) sunlight heating surface waters
- (B) very hot minerals deep underground
- (C) natural underground reservoirs of steam and hot water
- (D) the splitting of atoms to release energy

Fresh water is used for which of the following?

- (A) growing food
- (B) cooking
- (C) drinking
- (D) all of the above

Earth/Env. Science Practice Exam

Which of the following occurs at the continental margin in the Pacific Ocean?

- (A) plate interactions
- (B) earthquakes
- (C) volcanic activity
- (D) all of the above

Approximately how much of Earth's surface is covered by water?

- (A) 30 percent
- (B) 40 percent
- (C) 70 percent
- (D) 50 percent

Which part of the ocean is deepest?

- (A) trenches
- (B) rifts
- (C) seamounts
- (D) ridges

The process that occurs when physical forces break rock into smaller pieces without changing the rock's chemical composition is called

- (A) erosion
- (B) differential weathering
- (C) chemical weathering
- (D) mechanical weathering

Which of these factors affects the rate of weathering?

- (A) surface area of the exposed rock
- (B) climate
- (C) chemical composition of the exposed rock
- (D) all of the above

Wind power generates

- (A) air pollution
- (B) noise pollution
- (C) soil pollution
- (D) water pollution

Which of the following is NOT a land resource?

- (A) soil
- (B) wind
- (C) forests
- (D) iron

Which of the following is NOT a factor that affects the rate of weathering in rocks?

- (A) rock characteristics
- (B) amount of exposed surface area
- (C) climate
- (D) biological evolution

Which of the following is NOT a major component of soil?

- (A) earthworms
- (B) mineral matter
- (C) humus
- (D) air

The advantages of solar energy include the fact that it is

- (A) non-polluting
- (B) absent at night
- (C) expensive
- (D) nonrenewable

Which of the following weathering processes involves the constant freezing and thawing of water?

- (A) spheroidal weathering
- (B) unloading
- (C) frost wedging
- (D) exfoliation

Hydroelectric power is produced by

- (A) tides that pour through a dam barrier
- (B) electric current that flows across a dam
- (C) hot water that comes from deep underground
- (D) falling water that turns a turbine

Most surface ocean currents are caused by

- (A) tides
- (B) evaporation
- (C) prevailing winds
- (D) salinity differences

Compared to the speed of S-waves in a given Earth material, the speed of P-waves is

- (A) always slower
- (B) always identical
- (C) always faster
- (D) sometimes slower and sometimes faster

Which of the following is NOT an ocean resource?

- (A) silver
- (B) sand
- (C) natural gas
- (D) common table salt

On which two dates could all locations on Earth have equal hours of day and night?

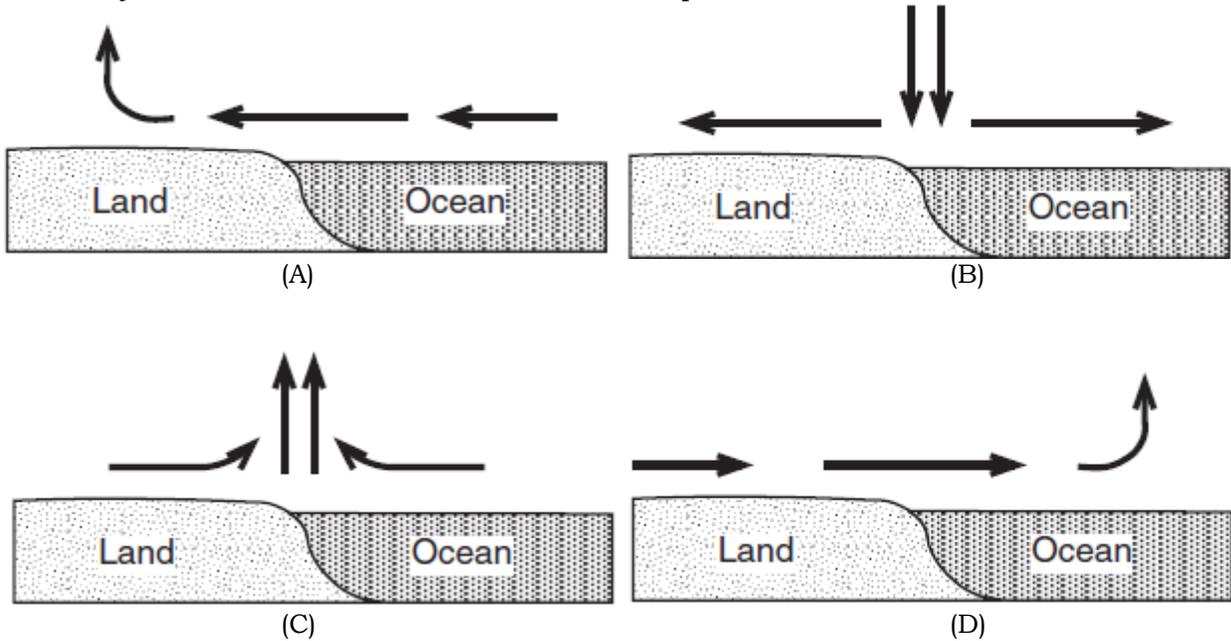
- (A) September 23 and December 21
- (B) December 21 and March 21
- (C) March 21 and June 21
- (D) March 21 and September 23

Earth/Env. Science Practice Exam

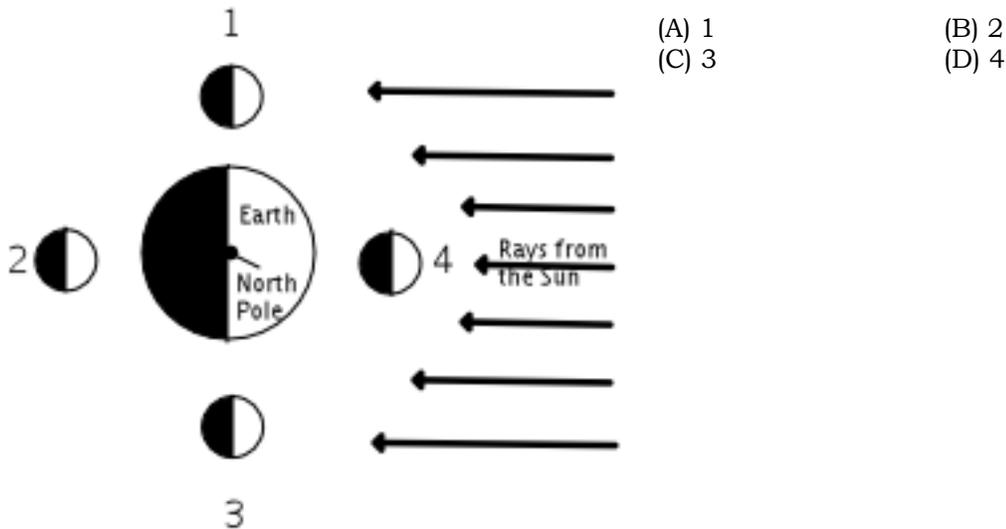
Which statement best explains why the angle of insolation received at any Earth location changes in a cyclic pattern throughout the year?

- (A) The Sun's orbit around Earth is an ellipse.
- (B) Earth's orbit around the Sun is an ellipse.
- (C) The Sun rotates on a tilted axis while revolving around Earth.
- (D) Earth rotates on a tilted axis while revolving around the Sun.

Adjacent land and ocean surfaces have the same temperature at sunrise on a clear, calm, summer day. Then the land and water are heated by the Sun for several hours. Which cross section shows the most likely direction of surface winds that will develop at this ocean shore?



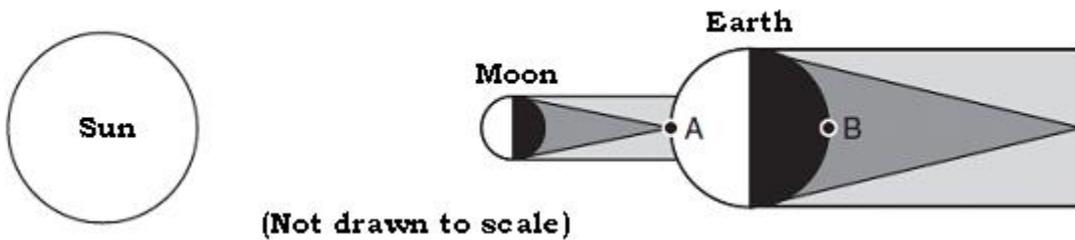
The diagram below shows the Moon at four positions in its orbit around Earth. An observer on Earth could see a solar eclipse when the Moon is at position



- (A) freezing of water in the cracks of a sandstone sidewalk
- (B) grinding of talc into a powder
- (C) abrasion of a streambed by tumbling rocks
- (D) dissolving of limestone by acid rain

Earth/Env. Science Practice Exam

The diagram below shows the relative positions of the Sun, the Moon, and Earth when an eclipse was observed from Earth. Positions A and B are locations on Earth's surface.



Which statement correctly describes the type of eclipse that was occurring and the position on Earth where this eclipse was observed?

- (A) A lunar eclipse was observed from position A.
- (B) A lunar eclipse was observed from position B.
- (C) A solar eclipse was observed from position A.
- (D) A solar eclipse was observed from position B.

An air mass classified as mP usually forms over which type of Earth surface?

- (A) warm land
- (B) cool land
- (C) warm ocean
- (D) cool ocean

Most inferences about the characteristics of Earth's mantle and core are based on

- (A) the behavior of seismic waves in Earth's interior
- (B) well drillings from Earth's mantle and core
- (C) chemical changes in exposed and weathered metamorphic rocks
- (D) comparisons between Moon rocks and Earth rocks

A huge undersea earthquake off the Alaskan coastline could produce a

- (A) tsunami
- (B) hurricane
- (C) cyclone
- (D) thunderstorm

Land surfaces of Earth heat more rapidly than water surfaces because

- (A) more energy from the Sun falls on land than on water
- (B) land has a lower specific heat than water
- (C) sunlight penetrates to greater depths in land than in water
- (D) less of Earth's surface is covered by land than by water

Which star color indicates the hottest star surface temperature?

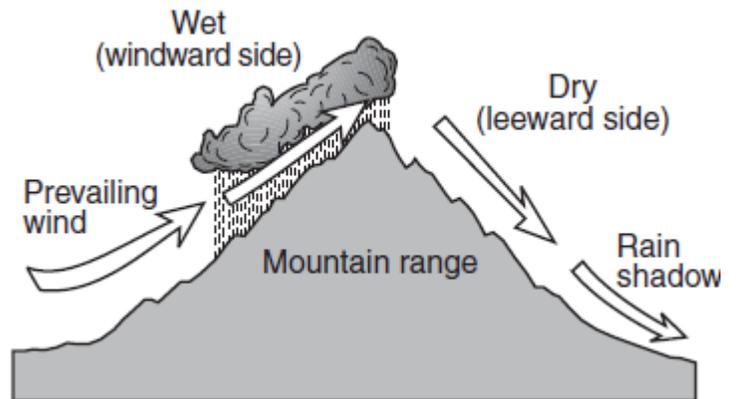
- (A) blue
- (B) yellow
- (C) white
- (D) red

Surface ocean currents located at 40° south latitude, 90° west longitude generally flow toward the

- (A) northeast
- (B) southwest
- (C) southeast
- (D) west

The cross section below shows how prevailing winds have caused different climates on the windward and leeward sides of a mountain range. Why does the windward side of this mountain have a wet climate?

- (A) Rising air compresses and cools, causing the water droplets to evaporate.
- (B) Rising air compresses and warms, causing the water vapor to condense.
- (C) Rising air expands and cools, causing the water vapor to condense.
- (D) Rising air expands and warms, causing the water droplets to evaporate.



Earth/Env. Science Practice Exam

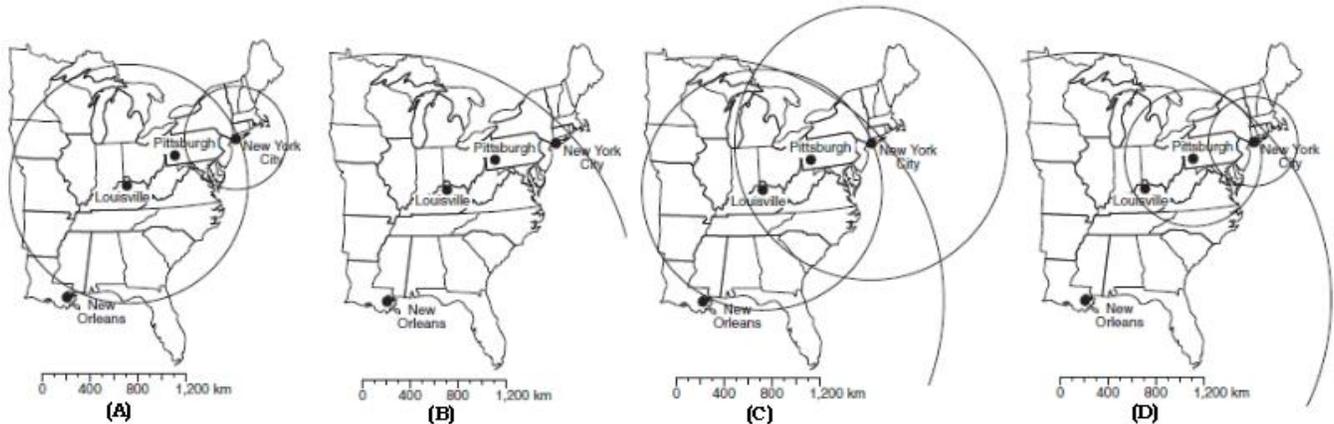
Base your answers to the next two questions on the map below. Seismic stations are located at the four cities shown on the map. Letter X represents the epicenter of an earthquake determined from seismic waves recorded at all four cities.



At which city is there a difference of approximately 3 minutes and 20 seconds between the arrival times of the P-waves and the S-waves?

- (A) New Orleans
- (B) Louisville
- (C) Pittsburgh
- (D) New York City

Which map correctly shows how the location of the epicenter was determined?



The length of an Earth day is determined by the time required for approximately one

- (A) Earth rotation
- (B) Earth revolution
- (C) Sun rotation
- (D) Sun revolution

What is the dewpoint when the dry-bulb temperature is 24°C and the wet-bulb temperature is 15°C?

- (A) 8°C
- (B) -18°C
- (C) 36°C
- (D) 4°C

In the United States, dry, cool air masses (cP) often interact with moist, warm air masses (mT). Which statement correctly matches each air mass with its usual geographic source region?

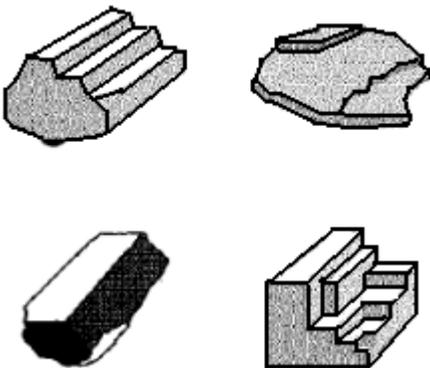
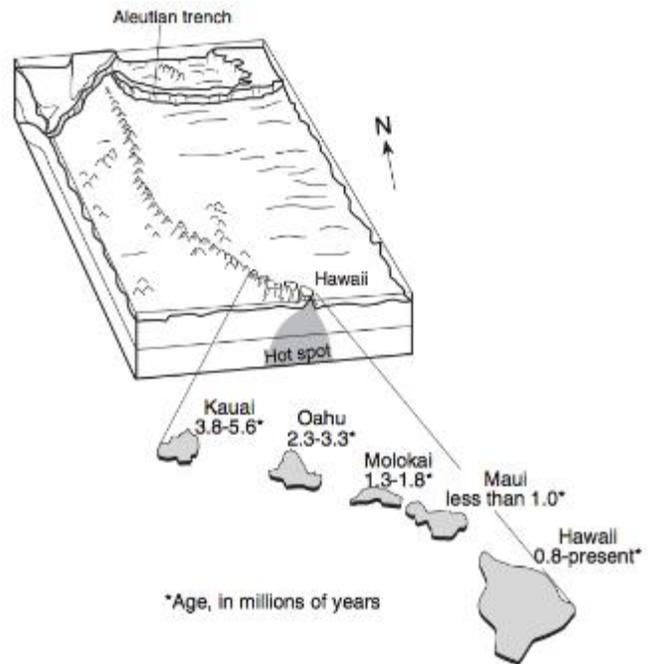
- (A) cP is from the North Atlantic Ocean and mT is from the deserts of the southwestern United States.
- (B) cP is from northern Canada and mT is from the deserts of the southwestern United States.
- (C) cP is from northern Canada and mT is from the Gulf of Mexico.
- (D) cP is from the North Atlantic Ocean and mT is from the Gulf of Mexico.

Earth/Env. Science Practice Exam

The block diagram below shows the bedrock age as measured by radioactive dating and the present location of part of the Hawaiian Island chain. These volcanic islands may have formed as the Pacific Plate moved over a mantle hot spot.

This diagram provides evidence that the Pacific Crustal Plate was moving towards the

- (A) south
- (B) east
- (C) southwest
- (D) northwest



The diagrams to the left represent fractured samples of four minerals.

Which mineral property is best illustrated by the samples?

- (A) hardness
- (B) streak
- (C) cleavage
- (D) density

Approximately how long does an earthquake P-wave take to travel the first 6500 kilometers after the earthquake occurs?

- (A) 6.5 min
- (B) 8.0 min
- (C) 10.0 min
- (D) 18.5 min

Locations in North Carolina are warmest in summer because sunlight in summer is

- (A) least intense and of shortest duration
- (B) least intense and of longest duration
- (C) most intense and of shortest duration
- (D) most intense and of longest duration

Which features are commonly formed at the plate boundaries where continental crust converges with oceanic crust?

- (A) large volcanic mountain ranges parallel to the coast at the center of the continents
- (B) a deep ocean trench and a continental volcanic mountain range near the coast
- (C) an underwater volcanic mountain range and rift valley on the ocean ridge near the coast
- (D) long chains of mid-ocean volcanic islands perpendicular to the coast

A student read in a newspaper that the maximum length of the daylight period for the year in Charlotte, North Carolina, had just been reached. What was the date of this newspaper?

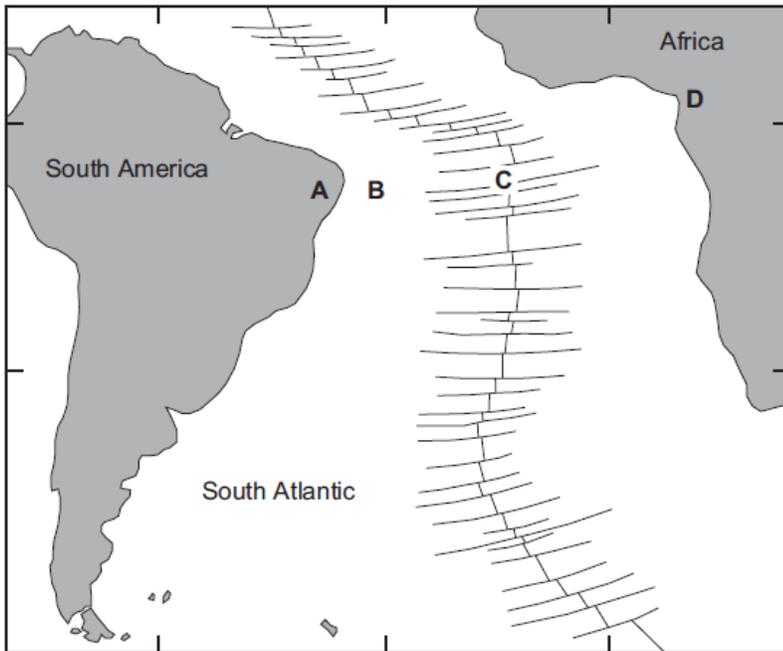
- (A) March 22
- (B) June 22
- (C) September 22
- (D) December 22

During which process does heat transfer occur because of density differences?

- (A) conduction
- (B) convection
- (C) radiation
- (D) reflection

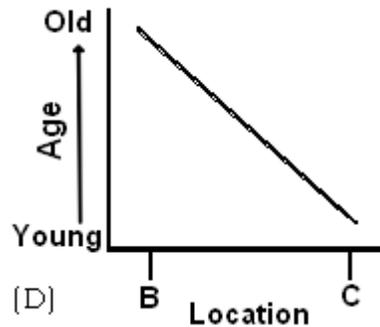
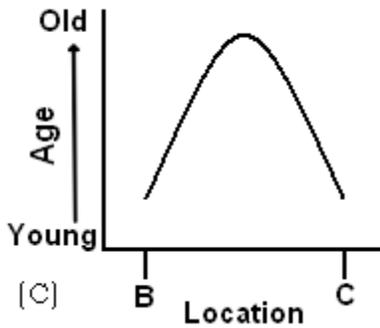
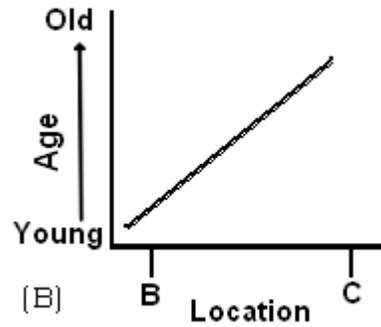
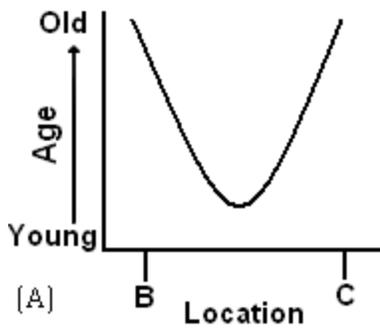
Earth/Env. Science Practice Exam

Base your answers to the next two questions on the map below. The map shows the continents of Africa and South America, the ocean between them, and the ocean ridge and transform faults. Locations A and D are on the continents. Locations B and C are on the ocean floor.



The hottest crustal temperature measurements would most likely be found at location
(A) A (B) B
(C) C (D) D

Which graph best shows the relative age of the ocean-floor bedrock from location B to location C?



Earth/Env. Science Practice Exam

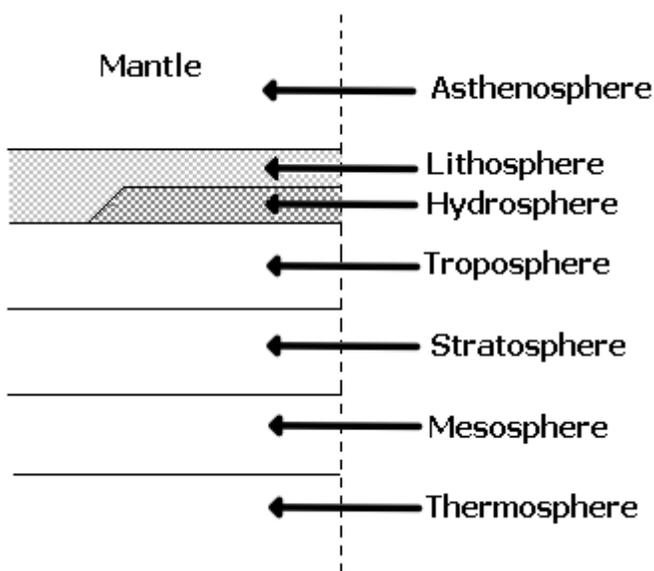
The table below shows the duration of insolation at different latitudes for three different days during the year.

Latitude	Day 1 Duration of Insolation (hours)	Day 2 Duration of Insolation (hours)	Day 3 Duration of Insolation (hours)
90° N	24	12	0
80° N	24	12	0
70° N	24	12	0
60° N	18 ½	12	5 ½
50° N	16 ¼	12	7 ¾
40° N	15	12	9
30° N	14	12	10
20° N	13 ¼	12	10 ¾
10° N	12 ½	12	11 ½
0°	12	12	12

Which dates are represented most correctly by Day 1, Day 2, and Day 3, respectively?

- (A) March 21, September 22, December 21
- (B) June 21, September 22, December 21
- (C) September 22, December 21, March 21
- (D) December 21, March 21, June 21

The diagram below shows spheres associated with Earth.



Which spheres are zones of Earth's atmosphere?

- (A) lithosphere, hydrosphere, and troposphere
- (B) stratosphere, mesosphere, and thermosphere
- (C) asthenosphere, lithosphere, and hydrosphere
- (D) hydrosphere, troposphere, and stratosphere

Which type of air mass usually contains the most moisture?

- (A) mT (B) mP (C) cT (D) cP

Ozone is concentrated in Earth's atmosphere at an altitude of 20 to 35 kilometers. Which atmospheric layer contains the greatest concentration of ozone?

- (A) mesosphere (B) thermosphere (C) troposphere (D) stratosphere

Earth/Env. Science Practice Exam

An earthquake's P-wave arrived at a seismograph station at 02 hours 40 minutes 00 seconds. The earthquake's S-wave arrived at the same station 2 minutes later. What is the approximate distance from the seismograph station to the epicenter of the earthquake?

- (A) 1,100 km (B) 2,400 km (C) 3,100 km (D) 4,000 km

Liquid water can store more heat energy than an equal amount of any other naturally occurring substance because liquid water

- (A) covers 71% of Earth's surface (B) has its greatest density at 4°C
(C) has the higher specific heat (D) can be changed into a solid or a gas

Which terms describe both the changes in the maximum altitude of the Moon and the changes in the Moon's phases over a period of several years?

- (A) cyclic and predictable (B) cyclic and unpredictable
(C) noncyclic and predictable (D) noncyclic and unpredictable

Base your answers to the next two questions on Moh's mineral hardness scale and the chart below showing the approximate hardness of some common objects.

Which statement is best supported by this scale?

- (A) A fingernail will scratch calcite, but not quartz.
(B) A fingernail will scratch quartz, but not calcite.
(C) A piece of glass can be scratched by quartz, but not by calcite.
(D) A piece of glass can be scratched by calcite, but not by quartz.

The hardness of these minerals is most closely related to the

- (A) mineral's color
(B) mineral's abundance in nature
(C) amount of iron the mineral contains
(D) internal arrangement of the mineral's atoms

Moh's Mineral Hardness Scale		
Talc	1	
Gypsum	2	
Calcite	3	
Fluorite	4	
Apatite	5	
Feldspar	6	
Quartz	7	
Topaz	8	
Corundum	9	
Diamond	10	

Approximate Hardness of Common Objects
Fingernail (2.5)
Copper penny (3.5)
Iron nail (4.5)
Glass (5.5)
Steel file (6.5)
Streak plate (7.0)

On June 21, some Earth locations have 24 hours of daylight. These locations are all between the latitudes of

- (A) 0° and 23°N (B) 23°N and 47°N
(C) 47°N and 66°N (D) 66°N and 90°N

As the altitude increases within Earth's stratosphere, air temperature generally

- (A) decreases, only (B) increases, only
(C) decreases, then increases (D) increases, then decreases

Which atmospheric conditions would cause smoke from a campfire on a beach to blow toward the ocean?

- (A) warm air over the land and cool air over the ocean
(B) humid air over the land and dry air over the ocean
(C) low density air over the land and high density air over the ocean
(D) high air pressure over the land and low air pressure over the ocean

The Coriolis effect provides evidence that Earth

- (A) rotates (B) has a tilted axis (C) has seasons (D) revolves

A cycle of Moon phases can be seen from Earth because the

- (A) Moon's distance from Earth changes at a predictable rate (B) Moon's axis is tilted
(C) Moon spins on its axis (D) Moon revolves around Earth

Earth/Env. Science Practice Exam

A high air-pressure, dry-climate belt is located at which Earth latitude?

- (A) 0° (B) 15° N (C) 30° N (D) 60° N

The average temperature at Earth's North Pole is colder than the average temperature at the Equator because the Equator

- (A) receives less ultraviolet radiation (B) receives more intense insolation
(C) has more cloud cover (D) has a thicker atmosphere

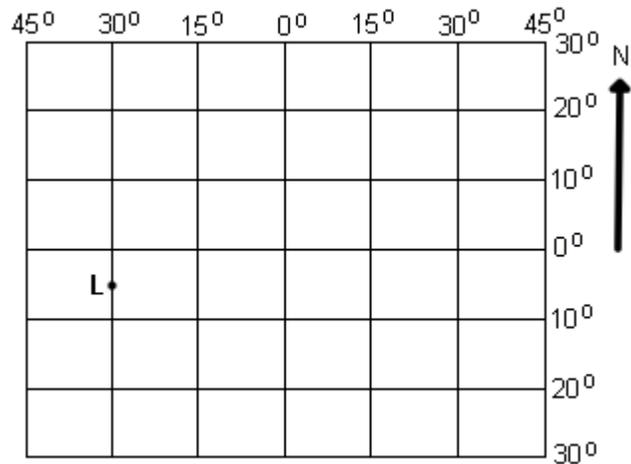
Rocks can be classified as sedimentary, igneous, or metamorphic based primarily upon differences in their

- (A) color (B) density (C) origin (D) age

The diagram below represents part of Earth's latitude-longitude system.

What is the latitude and longitude of point L?

- (A) 5° E 30° N (B) 5° W 30° S
(C) 5° N 30° E (D) 5° S 30° W



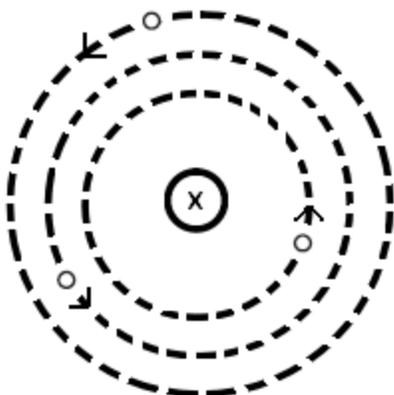
An increase in which gas would cause the most greenhouse warming of Earth's atmosphere?

- (A) nitrogen (B) oxygen (C) carbon dioxide (D) hydrogen

The diagram below represents a simple **geocentric** model.

Which object is represented by the letter X?

- (A) Earth (B) Sun
(C) Moon (D) Polaris



(Not drawn to scale)

Earth/Env. Science Practice Exam

Base your answers to the next three questions on the map below, which shows the location of the Peru-Chile Trench.

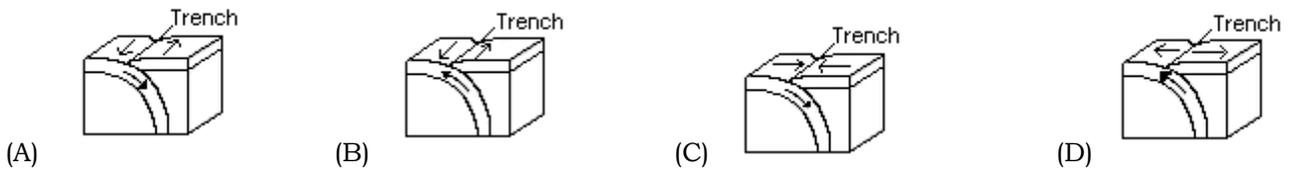


- The Peru-Chile Trench marks the boundary between the
- (A) Pacific Plate and the Antarctic Plate
 - (B) Nazca Plate and the South American Plate
 - (C) North American Plate and the Cocos Plate
 - (D) Caribbean Plate and the Scotia Plate

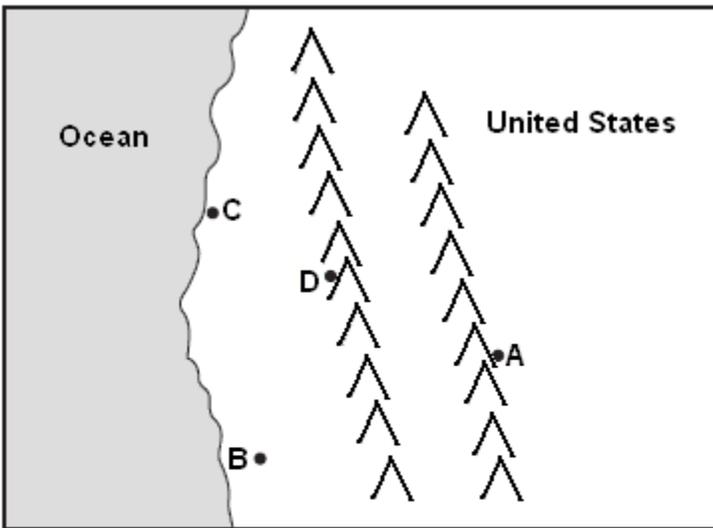
Which observation provides the best evidence of the pattern of crustal movement at the Peru-Chile Trench?

- (A) the direction of flow of warm ocean currents
- (B) the mineral composition of samples of mafic mantle rock
- (C) comparison of the rates of sediment deposition
- (D) the locations of shallow-focus and deep focus Earthquakes

In which diagram do the arrows best represent the motions of Earth's crust at the Peru-Chile Trench?

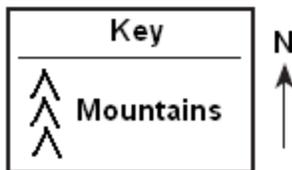


The map below shows the location of four cities, A, B, C, and D, in the western United States where prevailing winds are from the southwest.



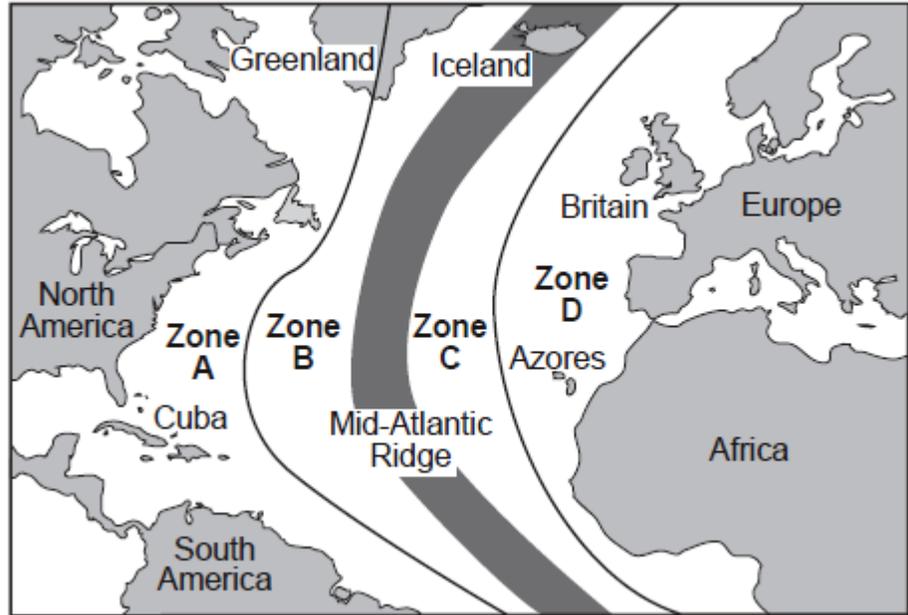
Which city most likely receives the least amount of average yearly precipitation?

- (A) A
- (B) B
- (C) C
- (D) D

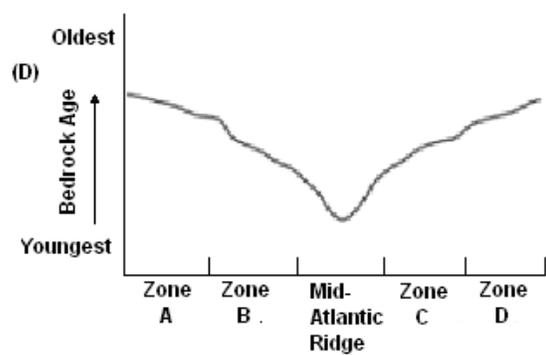
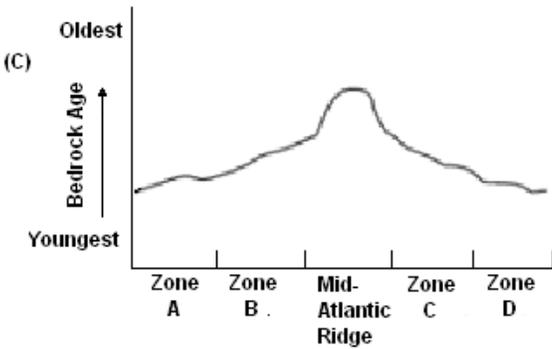
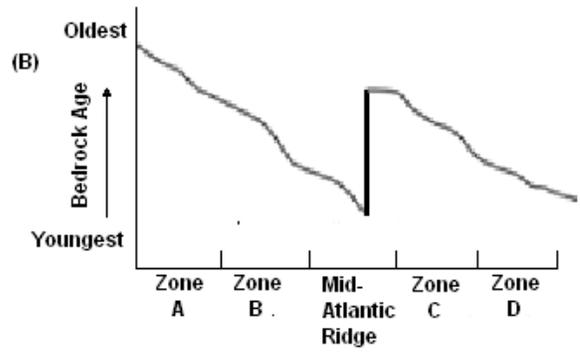
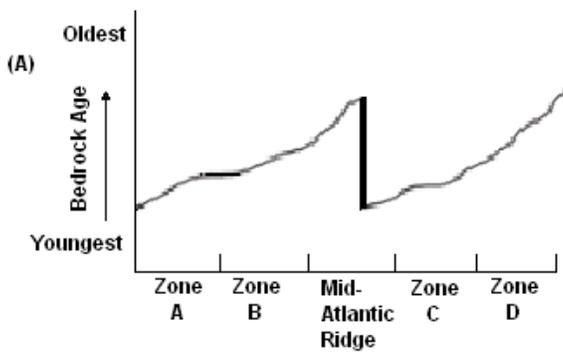


Earth/Env. Science Practice Exam

The map below shows the Atlantic Ocean divided into zones A, B, C, and D. The Mid-Atlantic Ridge is located between zones B and C.



Which graph best represents the geologic age of the surface bedrock on the ocean bottom?

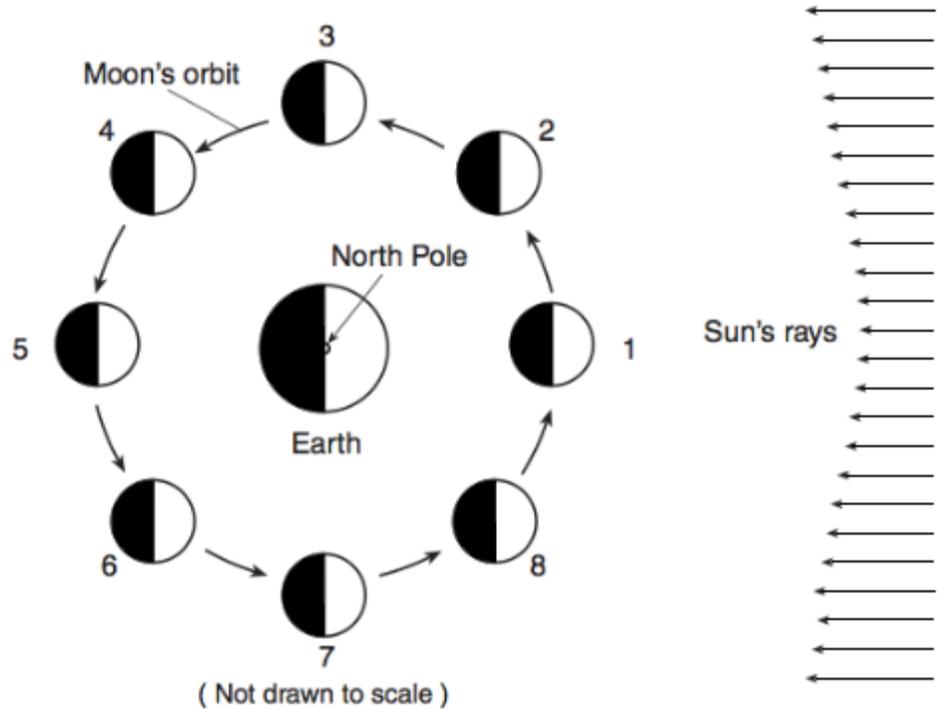


Earth/Env. Science Practice Exam

The diagram below shows the Moon orbiting Earth as viewed from space above the North Pole. The Moon is shown at eight different positions in its orbit.

At which two positions of the Moon is an eclipse of the Sun or Moon possible?

- (A) 1 and 5
- (B) 2 and 6
- (C) 3 and 7
- (D) 4 and 8



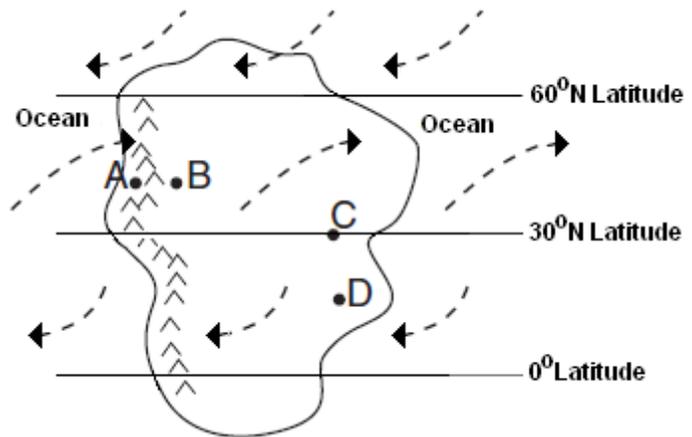
In which direction do surface winds around low pressure centers in the Northern Hemisphere generally move?

- (A) counterclockwise, toward the center of the low
- (B) clockwise, toward the center of the low
- (C) counterclockwise, away from the center of the low
- (D) clockwise, away from the center of the low

Base your answers to the next two questions on the map below. The map shows an imaginary continent on Earth. Arrows represent prevailing wind directions. Letters A through D represent locations on the continent. Locations A and B are at the same latitude and at the same elevation at the base of the mountains.

Over the course of a year, compared to location B, location A will have

- (A) less precipitation and a smaller temperature range
- (B) less precipitation and a greater temperature range
- (C) more precipitation and a smaller temperature range
- (D) more precipitation and a greater temperature range



The climate at location C is much drier than at location D. This difference is best explained by the fact that location C is located

- (A) farther from any mountain range
- (B) closer to a large body of water
- (C) at a latitude that experiences longer average annual daylight
- (D) at a latitude where air is sinking and surface winds diverge