

VIRGINIA STANDARDS OF LEARNING

Spring 2007 Released Test

# END OF COURSE EARTH SCIENCE

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Form S0117, CORE 1

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**Directions**

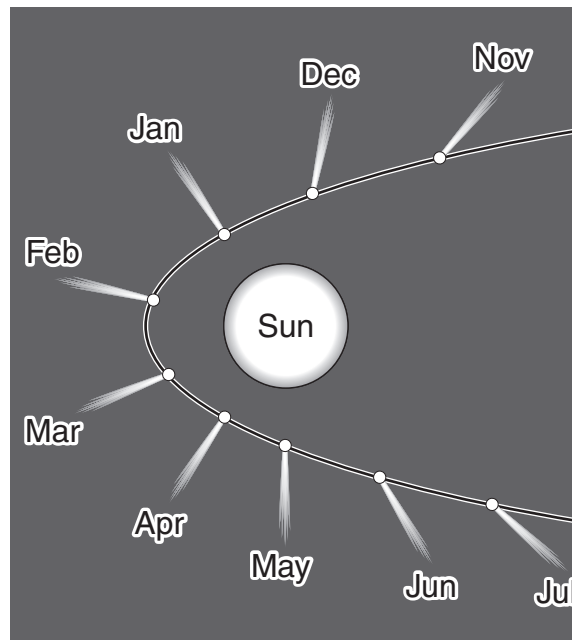
Read each question carefully and choose the best answer. Then mark the space on your answer document for the answer you have chosen.

**SAMPLE**

**Which of these can be used to measure atmospheric pressure?**

- A** An anemometer
- B** A barometer
- C** A thermometer
- D** A seismometer

1



**Why does a comet's tail point away from the Sun?**

- A** The solar wind blows the tail away from the Sun.
- B** It is being pulled by a nearby black hole.
- C** The Moon's light only shines on part of the comet.
- D** The comet's tail is following the path of Jupiter.

**2 Cloudy nights can be warmer than clear nights because clouds trap heat —**

- F** generated from tropical winds
- G** produced by the friction of air particles
- H** released from Earth's interior
- J** absorbed by Earth during daylight hours

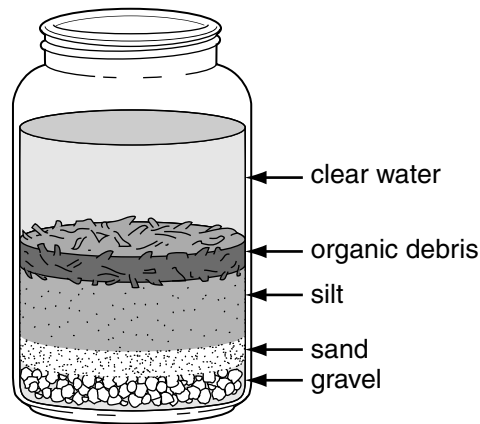
- 3 In the gold rush of 1849, prospectors found a yellow mineral that appeared to be gold, but was harder and more brittle than gold. What is this mineral that came to be called “fool’s gold”?**
- A** Calcite
  - B** Copper
  - C** Sulfur
  - D** Pyrite
- 4 Which provides the *best* evidence for the theory that faults and volcanoes are results of tectonic plate interactions?**
- F** Faults on tectonic plates are in constant motion, but volcanoes may not erupt for many years.
  - G** Faults and volcanoes existed long before there were tectonic plates.
  - H** Tectonic plates that have many faults do not usually have volcanoes.
  - J** Faults and volcanoes are often found at tectonic plate boundaries.
- 5 Which of these is likely to occur after moist air is cooled below its dew point?**
- A** Water condenses.
  - B** Evaporation increases.
  - C** Ice crystals melt.
  - D** Winds are generated.

**6 The breakdown of rocks and minerals into smaller particles without a change in composition is called —**

- F** igneous intrusion
- G** chemical precipitation
- H** mechanical weathering
- J** metamorphic foliation

**7 Metamorphic rocks with a layered or banded look are called —**

- A** foliated
- B** unfoliated
- C** striated
- D** evaporated



**In the jar shown, a sample of soil was mixed with water and then allowed to settle for 24 hours. The jar serves as a model for what process?**

- F** Evaporation of water from a muddy pond
- G** Formation of soil from parent material
- H** Deposition of sediment in a lake bed
- J** Erosion of rock particles by water

**9 Which recent geologic processes commonly occur in the Coastal Plain region of Virginia?**

- A** Crustal uplift and rock deformation
- B** Rifting and intrusion
- C** Erosion and deposition
- D** Subduction and metamorphism

- 10 Dramatic variations in the polar ice caps *most* likely suggest changes in —**
- F** the Moon's orbit
  - G** Earth's climate
  - H** ebb and flow of tides
  - J** global water consumption
- 11 Rocky objects, measuring millimeters to kilometers in diameter, generally orbit the Sun in a region located between —**
- A** Mercury and Venus
  - B** Earth and Mars
  - C** Mars and Jupiter
  - D** Neptune and Pluto
- 12 Which of these *best* describes forest soil?**
- F** More rock fragments in the humus layer than in deeper layers
  - G** More organic matter in the humus layer than in deeper layers
  - H** More clay in the humus layer than in deeper layers
  - J** More sand-sized particles in the humus layer than in deeper layers



**13 All of the following may be found deep in a natural cave EXCEPT —**

- A** groundwater
- B** mineral deposits
- C** photosynthetic organisms
- D** stalagmites

**14 Identical rock types, identical fossils, and very similar mountain ranges are found on different continents that are separated by a wide ocean. Which of these *best* explains these observations?**

- F** Organisms traveled between these continents on land bridges.
- G** The same forces erode mountains in different locations.
- H** These continents were joined together at one time in the past.
- J** Some rock types are very common and are found everywhere.

**15 Which of these provides the *best* estimate of how long it took a thick layer of sedimentary rock to form?**

- A** Using a microscope to closely examine the size of particles that make up the rock layer
- B** Making a model that creates a sedimentary rock layer at a constant rate
- C** Calculating the age of the top and bottom of the layer
- D** Measuring the rate at which similar layers of sediments collect

**16 Which of these planets has the smallest diameter and the greatest average density?**

- F** Neptune
- G** Jupiter
- H** Saturn
- J** Mercury

**17**

**Conditions at Time 1**

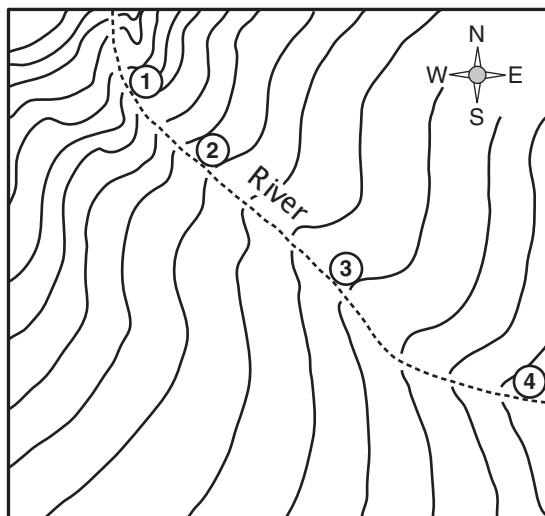
Temperature	30°C
Pressure	996 mb
Wind direction	From the south
Precipitation	None

**Conditions at Time 2**

Temperature	25°C
Pressure	1010 mb
Wind direction	From the north
Precipitation	None

**Based on the changes between the weather conditions, which of these *most* likely passed by the weather station between time 1 and time 2?**

- A** Thunderstorm
- B** Low pressure area
- C** Cold front
- D** Warm front

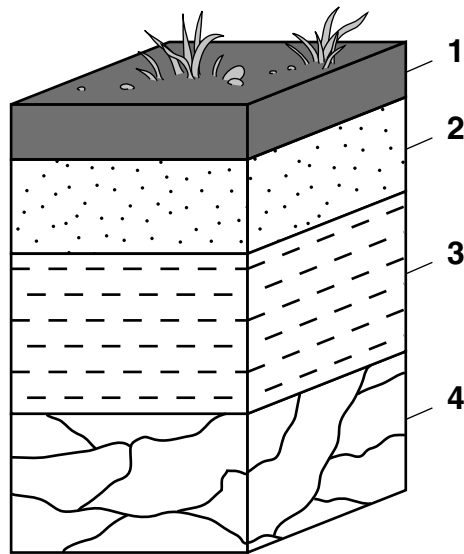


The river shown on the topographic map flows fastest at point —

- F** 1
- G** 2
- H** 3
- J** 4

**19** Which of these describes the area immediately below a water table?

- A** Zone of aeration
- B** Capillary zone
- C** Recharge zone
- D** Zone of saturation

**Soil Profile**

Which layer of the soil profile would be affected the *most* by weathering and erosion?

- F** 1
- G** 2
- H** 3
- J** 4

**21** The folding and faulting found in the rocks of the Blue Ridge Mountains of Virginia were created by —

- A** collisions of continental plates
- B** wave action of prehistoric ocean
- C** the Coriolis effect
- D** heating and cooling of the prehistoric atmosphere

**22 The streak test that is used to identify minerals involves studying the —**

- F** mineral's crystals with a microscope
- G** heated mineral's color as it cools
- H** appearance of the mineral under fluorescent light
- J** color of the powdered form of the mineral

**23 Seawater is typically denser than freshwater due to seawater's —**

- A** higher salinity
- B** lower freezing point
- C** smaller mass
- D** greater depth

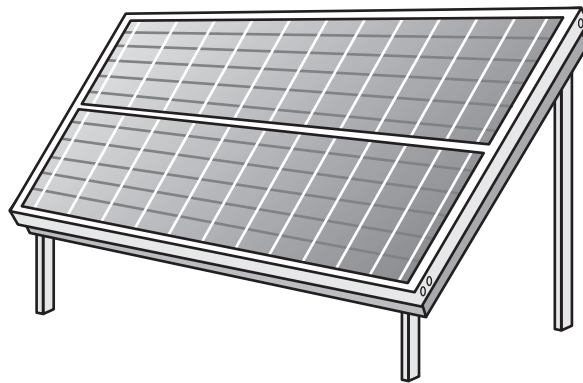
**24 Which of these *best* describes the composition of a nebula such as the Crab Nebula?**

- F** Large asteroids
- G** Clouds of dust and gas
- H** Ice crystals
- J** Planets and moons

**25 Which of the following may preserve ancient remains of plants and animals?**

- A** Granitic intrusion
- B** Volcanic ash
- C** Foliated schist
- D** Folded gneiss

**26**



Solar Panels

**The major disadvantage of using solar panels to generate electricity is that solar panels —**

- F** release toxic fumes into the air
- G** cannot convert energy efficiently
- H** are affected by cloud coverage and day length
- J** produce energy that cannot be stored

**27 Which of these describes the *most* common way that material is added to a continental shelf?**

- A** Evaporation from continental watersheds
- B** Deposition of continental sediments
- C** Eruption of continental volcanoes
- D** Subduction of continental plates

**28 Limestone chips dissolve after they are placed in a beaker of dilute acid. Which geologic process is this *most* similar to?**

- F** Faulting
- G** Folding
- H** Weathering
- J** Subduction

**29 Which of the following processes will change a sedimentary rock into an igneous rock?**

- A** Melting and crystallization
- B** Erosion and deposition
- C** Deformation and deposition
- D** Faulting and fracturing

**30 Obsidian, pumice, and scoria lack crystals because —**

- F** not enough minerals were present where they formed
- G** they cooled too quickly
- H** they cooled deep inside Earth
- J** they cooled too slowly

**Table of Geologic Time**

Era	Period	Years Before the Present
Cenozoic	Quaternary	recent – 2 million
	Tertiary	2 – 65 million
Mesozoic	Cretaceous	65 – 136 million
	Jurassic	136 – 190 million
	Triassic	190 – 225 million
Paleozoic	Permian	225 – 280 million
	Carboniferous	280 – 345 million
	Devonian	345 – 395 million
	Silurian	395 – 430 million
	Ordovician	430 – 500 million
	Cambrian	500 – 570 million
Precambrian		570 million – 4.6 billion

**Rocks found on land are up to 3.8 billion years old, but those in the ocean are no more than 180 million years old. Using the information shown, during which era could parts of the ocean floor have formed?**

- A** Triassic
- B** Paleozoic
- C** Precambrian
- D** Mesozoic

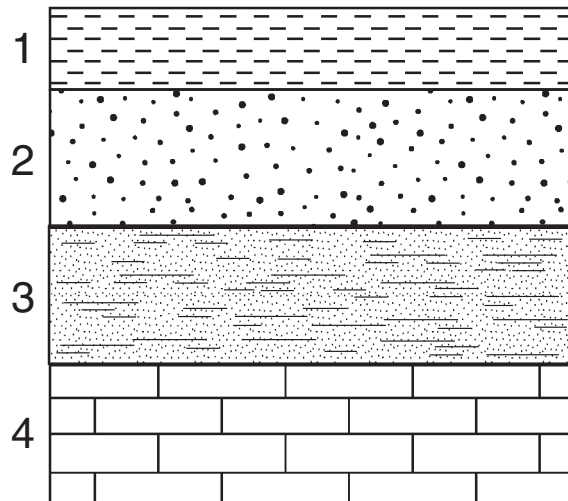


**32 Which of these are caused primarily by the gravitational force between Earth and the Moon?**

- F** Tides
- G** Seasons
- H** Prevailing winds
- J** Magnetic poles

**33 Which would be the *best* tools to measure the density of a small piece of silver ore?**

- A** A barometer and a balance
- B** A density probe and a 500 mL beaker
- C** A metric ruler and a metal detector
- D** A graduated cylinder and a balance

**Rock Layers**

**In this section of undisturbed sedimentary layers, which *best* describes layer 2?**

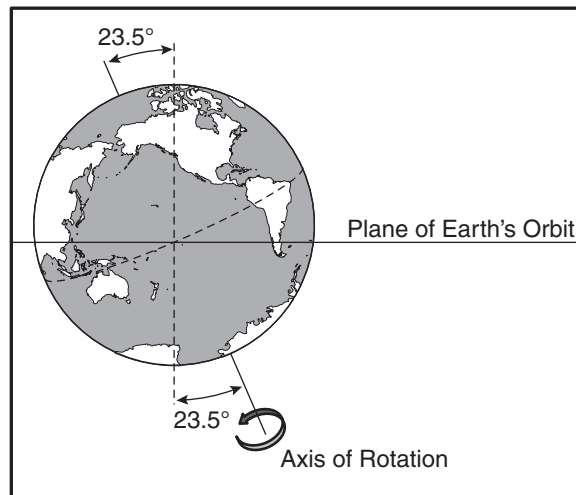
- F** It was intruded into layer 1.
- G** It was intruded into layer 3.
- H** It was deposited after layer 1.
- J** It was deposited after layer 3.

**Igneous Rock**

**The rock shown is composed primarily of large crystals that were formed by —**

- A** cooling magma
- B** compacting shells
- C** weathering
- D** faulting

### Earth Axis

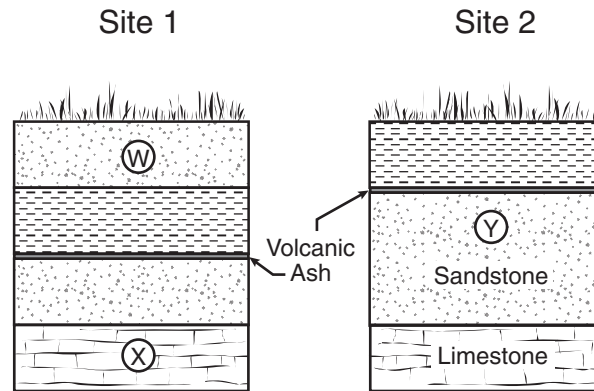


**Earth's axis of rotation is tilted  $23.5^\circ$  relative to the plane of its orbit, which helps to cause —**

- F** the seasons
- G** day and night
- H** the lunar phases
- J** high and low tides

**37 Some fuels are classified as nonrenewable because they —**

- A** produce toxic waste
- B** can be easily recycled
- C** come from deep within Earth
- D** require a long period of time to form



These geologic cross sections show the location of three fossilized species (W, X, and Y) found in rock layers at two nearby sites. Species X is probably the oldest species because it is found —

- F below species W
- G in the lowest layer
- H above the ash layer
- J in sandstone

39 Most water leaves the ocean through evaporation and returns to the ocean through —

- A surface runoff
- B ground water
- C transpiration
- D precipitation

**40 Rivers, springs, and aquifers are all -**

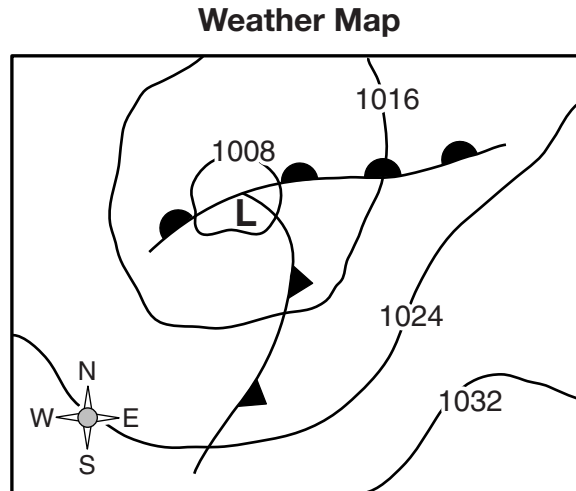
- F** frozen in winter
- G** human-made structures
- H** located above ground
- J** sources of fresh water

**41 Students plan to use several rain gauges to compare average monthly rainfall on Virginia's Coastal Plain and Piedmont regions. Which of these variables should be manipulated?**

- A** Height of the gauge
- B** Brand of the gauge
- C** Size of the gauge
- D** Location of the gauge

**42 Which natural resource found in Virginia is a common source of energy?**

- F** Bauxite
- G** Limestone
- H** Coal
- J** Zinc



The label L indicates an area of low —

- A** temperatures
- B** pressure
- C** altitude
- D** rainfall

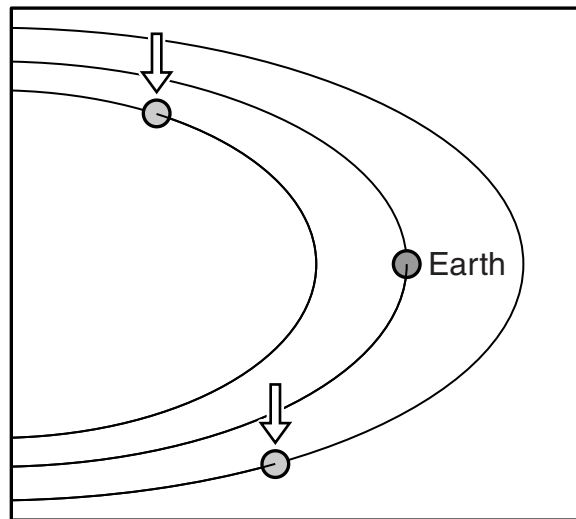
**44 Which of these planets travels around the Sun in less time than it takes Earth to complete one revolution?**

- F** Mars
- G** Saturn
- H** Mercury
- J** Uranus

**45 Which of these measurements allows scientists to compare the brightness of stars?**

- A** Absolute magnitude
- B** Critical density
- C** Orbital velocity
- D** Red shift

**46**



**In addition to Earth's orbit, which planets' orbits are shown?**

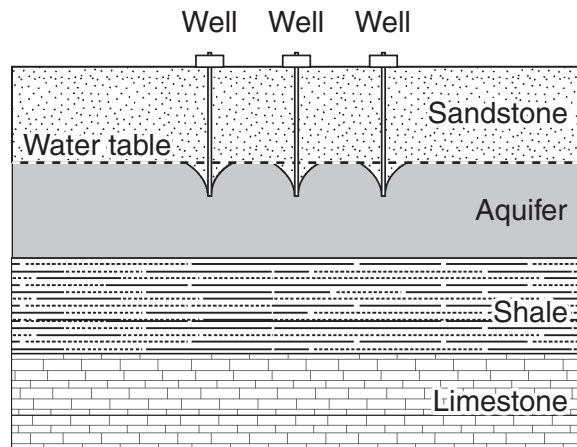
- F** Mars and Jupiter
- G** Jupiter and Saturn
- H** Venus and Mars
- J** Mercury and Venus



**47** When granite is subjected to high enough amounts of heat and pressure to change it but *not* melt it, granite changes into —

- A** a metamorphic rock
- B** a sedimentary rock
- C** sediments
- D** an igneous rock

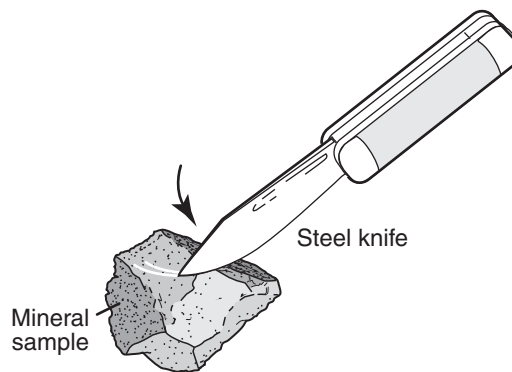
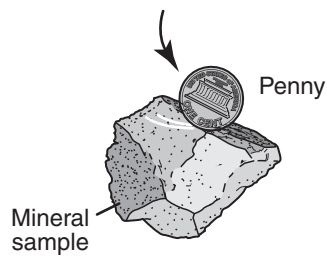
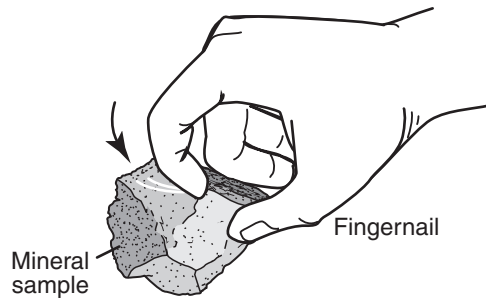
**48**



The three wells shown provide water for a growing city. What is the *most* likely effect on the system if six new wells are brought into production as the population increases?

- F** The limestone layer will collapse.
- G** The shale layer will shrink.
- H** The aquifer will increase in volume.
- J** The water table will drop.

## Testing a Mineral



**The diagram shows a test for which mineral property?**

- A** Hardness
- B** Cleavage
- C** Luster
- D** Streak

**50 A student claims that the full Moon occurs about once a month. What process will verify the student's claim?**

- F** Hypothesizing
- G** Theorizing
- H** Predicting
- J** Observing

