

**VIRGINIA  
STANDARDS OF LEARNING ASSESSMENTS**

**Spring 2002 Released Test**

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**END OF COURSE  
EARTH SCIENCE**

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**DIRECTIONS**

Read each question carefully and choose the best answer. Then mark the space on the answer sheet 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 Igneous rocks are formed by —**

- A heat and pressure on existing rocks
- B evaporation of water, leaving solids behind
- C cooling and hardening of molten rock
- D layers of mud on the bottom of a lake

**2 What is the main advantage of using dams to produce electrical energy?**

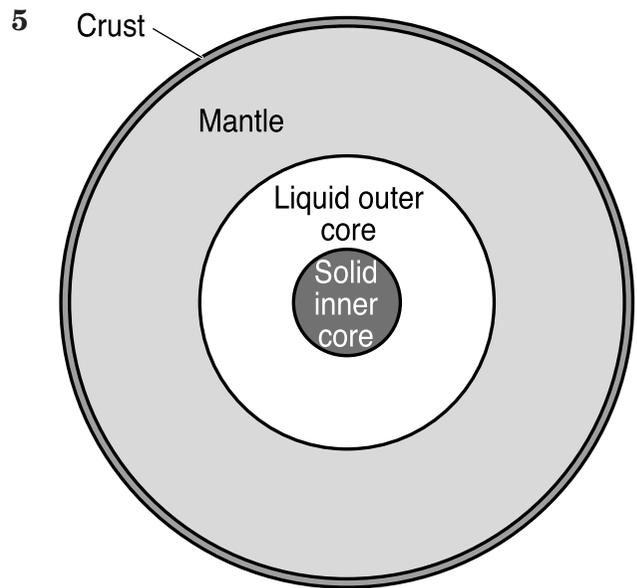
- F They can be built near most cities.
- G They do not produce much pollution.
- H They are inexpensive to build.
- J They do not damage wildlife homes.

**3 A student set up an experiment to test the effects of soil compaction on plant growth. The student put equal weights of moist soil into 10 containers, planted a bean seed one inch deep in each container, and then firmly compacted the soil in 5 of the containers. After the seeds sprouted, the student measured the height of each plant every day and kept a record of the results. What else must the student do over time to ensure a valid experiment?**

- A Water any container in which the soil feels dry
- B Water all of the containers the same amount and at the same time
- C Water any of the plants that seem to be growing more slowly than the others
- D Water the plants in compacted soil more than those in uncompacted soil

4 Which planet is often called “Earth’s twin” because it is similar in mass and diameter to the Earth?

- F Mars
- G Mercury
- H Venus
- J Pluto



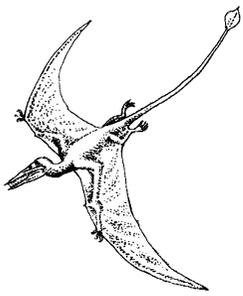
Even though the Earth’s inner core is hotter than the liquid outer core, it is still solid because —

- A the heat rising from the inner core is melting the outer core
- B there is more water in the outer core and it dilutes the materials
- C the outer core is farther from the center, and there is less gravity holding it together
- D the pressure from all of Earth’s layers keeps it in a solid state

6 A light-year measures —

- F brightness
- G distance
- H radiation
- J time

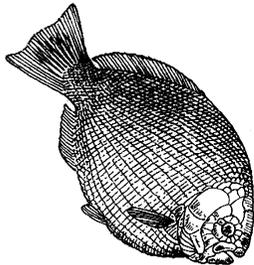
7 Which vertebrate did *not* live during the time of the dinosaurs (the Mesozoic Era)?



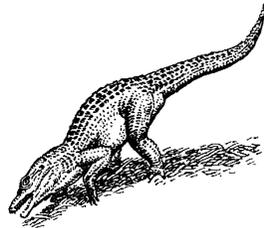
A



C



B



D

8 Land breezes and sea breezes are created by the differences in —

- F the Earth's tilt on its axis
- G solar radiation reaching the Earth's surface
- H the heat capacity between water and land
- J the living organisms occurring in the land and sea

9 Which of the following minerals found in the northern Piedmont province is known as "fool's gold"?

- A Pyrite
- B Hematite
- C Galena
- D Limonite

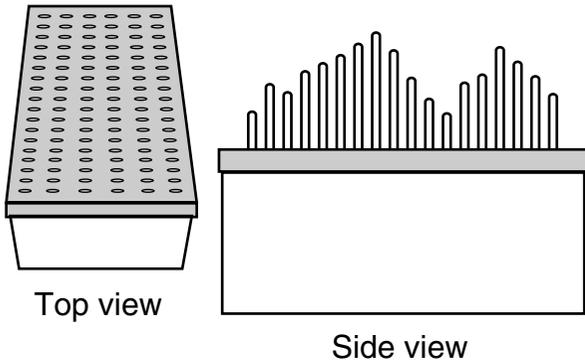
10



On weather maps, there are lines with tiny triangles on one side. This represents —

- F cold air moving in the direction the triangles point
- G cold air moving opposite the direction the triangles point
- H warm air moving in the direction the triangles point
- J warm air moving opposite the direction the triangles point

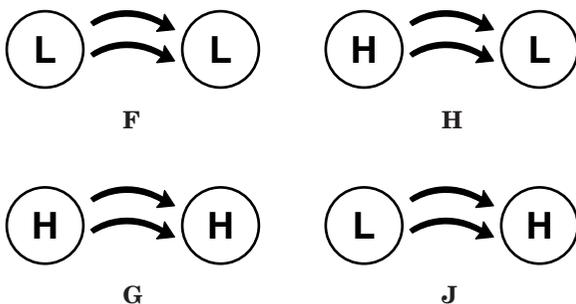
11



Pictured above is a shoebox with rows of holes in the top, large enough for straws to fit through. By placing straws through the holes, students have to determine the shape of an unseen object in the box. This activity simulates the technology used to map the seafloor. What is that technology called?

- A Laser beams
- B Doppler radar
- C Sonar
- D Seismology

12 Which diagram correctly shows wind motion between pressure areas?



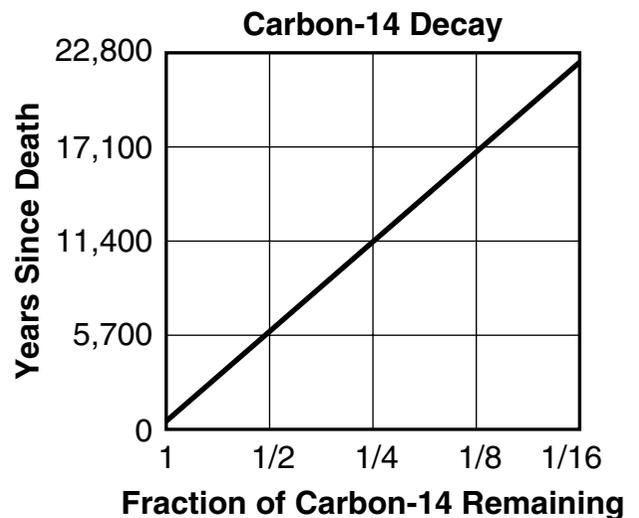
13 During droughts, lack of rain can lead to wells drying up. This is because the drought has lowered the —

- A water table
- B water trough
- C zone of aeration
- D zone of porosity

14 Which of these is the best evidence that the Earth's crust has undergone some major changes?

- F The location of major rivers
- G The amount of available water on Earth
- H The presence of marine fossils in mountain rock
- J The arrival of the vernal equinox

15

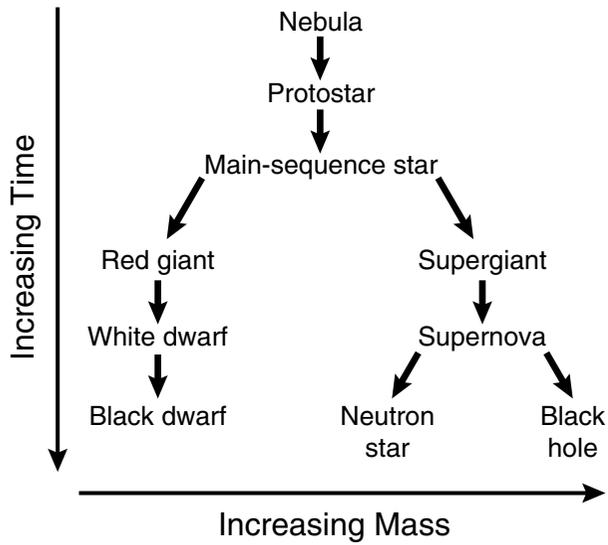


According to the graph above, a piece of timber containing one-eighth of the amount of carbon-14 that is found in a living tree died about how many years ago?

- A 5,700 years
- B 11,400 years
- C 17,100 years
- D 22,800 years

16

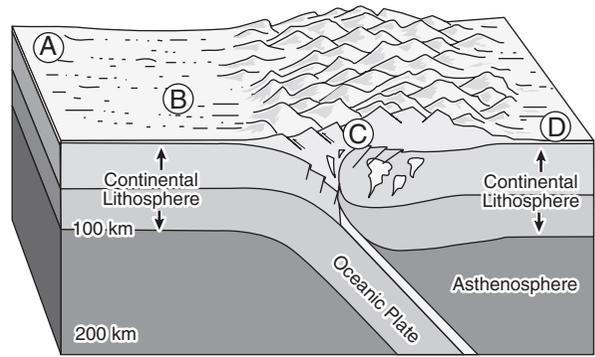
### The Life Cycle of a Star



What is the first stage in the life cycle of a star?

- F Black hole
- G Dwarf star
- H Main-sequence star
- J Stellar nebula

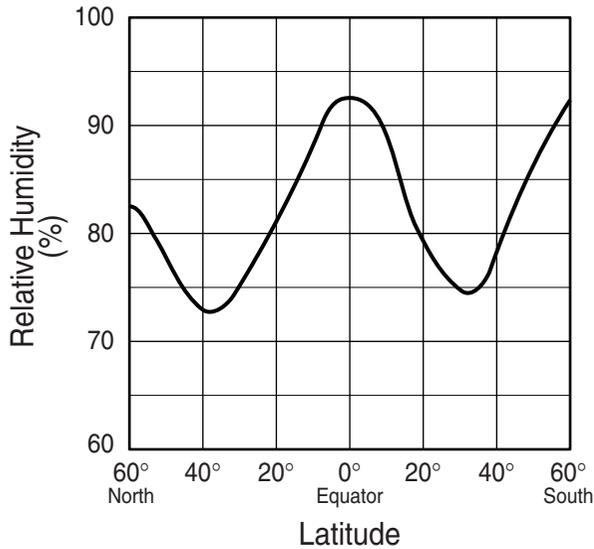
17



At which location are metamorphic rocks most likely to be found?

- A A
- B B
- C C
- D D

**Average Relative Humidity  
for Latitudes North and South  
of the Equator**



**Hypothesis: The average relative humidity decreases north and south of the equator.**

According to the data shown in the graph, the hypothesis is only correct for latitudes —

- F up to 40° from the equator
- G from the poles to 40° from the equator
- H between 20° and 60° from the equator
- J farthest from the equator

19 Of the following, the largest division on the geologic time scale is —

- A a year
- B an epoch
- C an era
- D a period

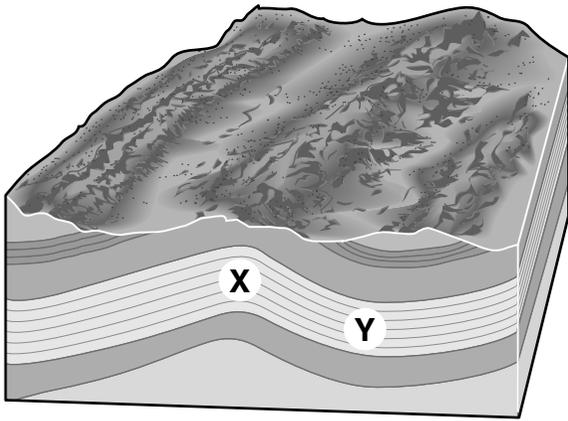
20 Saturn's volume is 762 times the volume of Earth, and yet its mass is only about 95 times that of Earth's mass. This is due to Saturn's —

- F low density
- G temperature
- H thousands of rings
- J distance from the sun

21 When placed in water, ice rises to the top of the liquid. Unlike most solids that sink when placed in their liquid forms, ice floats because —

- A it is colder than water
- B it is less dense than water
- C the pressure of the water holds it up
- D gases inside the ice make it buoyant

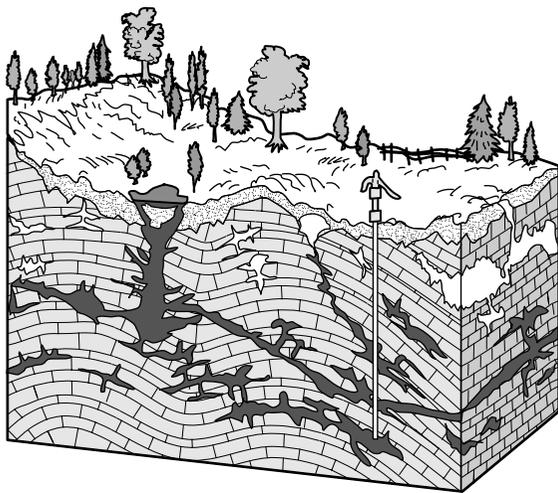
22



The formations at X and Y in the picture above were created by —

- F tension
- G shearing
- H compression
- J rifting

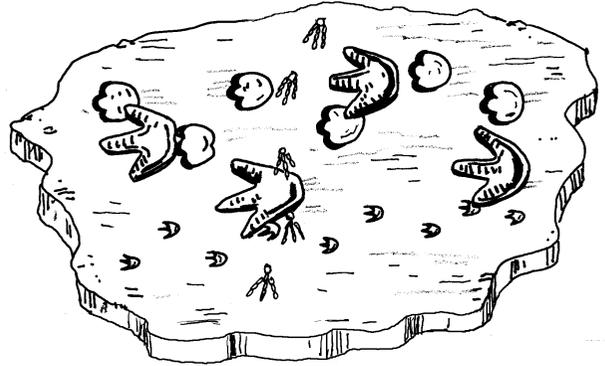
23



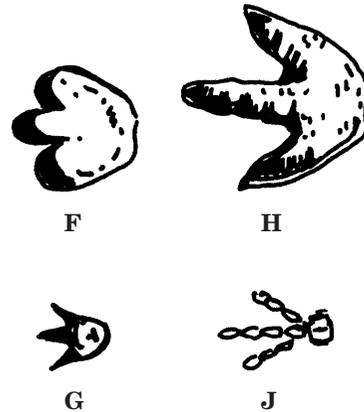
The picture above shows that one of the main pollution problems associated with sinkholes is that —

- A they can destroy roadways
- B tractors can fall into them
- C homes can be damaged by them
- D they can connect directly to the water table

24



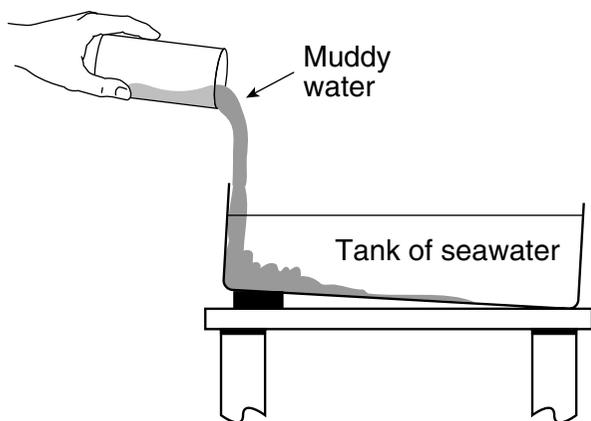
Which of these tracks was made last?



25 Orbital velocity is the average speed of a planet moving through space in its orbit around the sun. Which of the following planets has the fastest orbital velocity?

- A Mercury
- B Jupiter
- C Mars
- D Pluto

26 **Model of a Turbidity Current**



**What does the diagram illustrate about turbidity currents?**

- F They move along the bottom.
- G They stop moving as soon as they reach the ocean floor.
- H They are temperature-dependent.
- J They only occur in salt water.

**27 In karst regions, caves are carved by the flow of water through limestone bedrock. How do the stalagmites and stalactites in the caves develop?**

- A They are carbonate deposits formed by dripping water in air-filled cavities.
- B They are granite intrusions that remain behind after water dissolves the surrounding limestone.
- C They are crystals that grow as water hollows out the cavern.
- D They are carvings made in limestone by the swirling water as it hollows out the cavern.

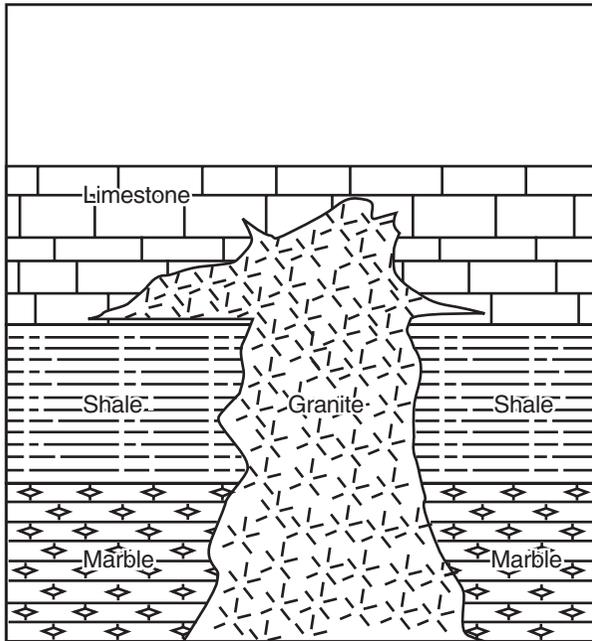
28 **MOHS' SCALE OF HARDNESS**

Mineral	Hardness	Common Tests
Talc	1	Scratched by a fingernail
Gypsum	2	
Calcite	3	Scratched by a copper coin
Fluorite	4	Scratched by a knife blade
Apatite	5	
Feldspar	6	Scratches a knife blade
Quartz	7	
Topaz	8	
Corundum	9	
Diamond	10	Scratches all common materials

**Which conclusion can be made based on the information in the chart?**

- F Quartz is harder than topaz.
- G Calcite is harder than apatite.
- H Fluorite is harder than feldspar.
- J Gypsum is harder than talc.

29



Which of the following rocks represents an igneous intrusion?

- A Granite
- B Limestone
- C Marble
- D Shale

30 Ocean → Evaporation → Condensation

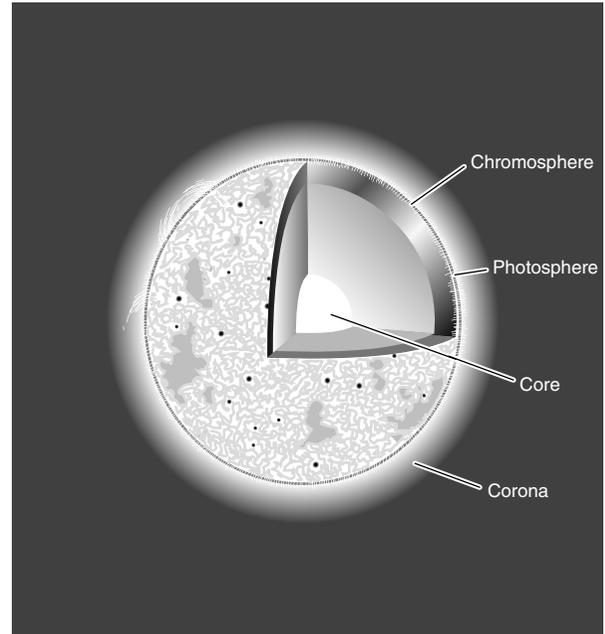
Which of these would come next in the water cycle?

- F Aeration
- G Sedimentation
- H Deposition
- J Precipitation

31 The edges of moving crustal plates are often defined by —

- A ocean basins
- B frequent seismic activity
- C intercontinental plains
- D Earth's largest rivers

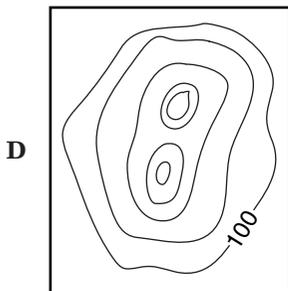
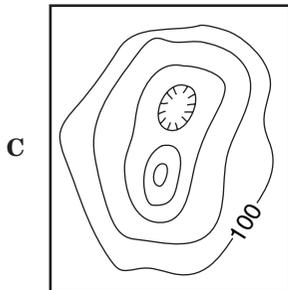
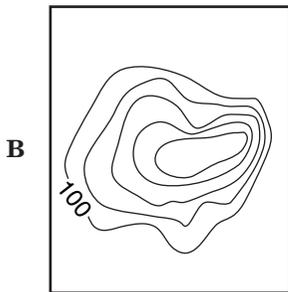
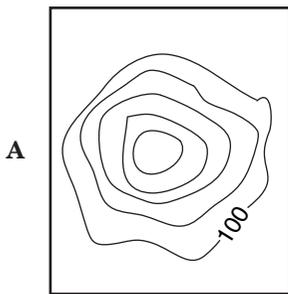
32



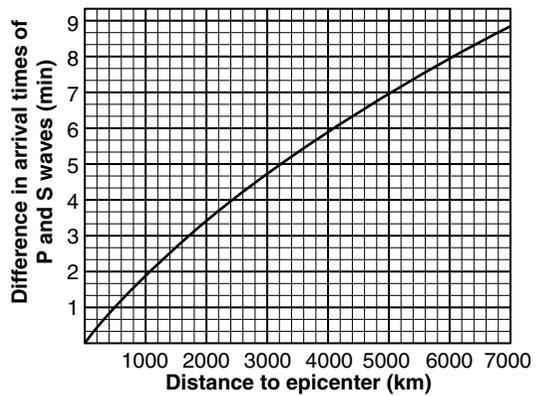
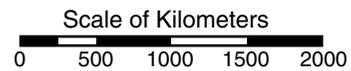
Which layer of the sun is the most dense?

- F Chromosphere
- G Photosphere
- H Core
- J Corona

33 The topographic map that may show a hill with a volcanic crater is —



34



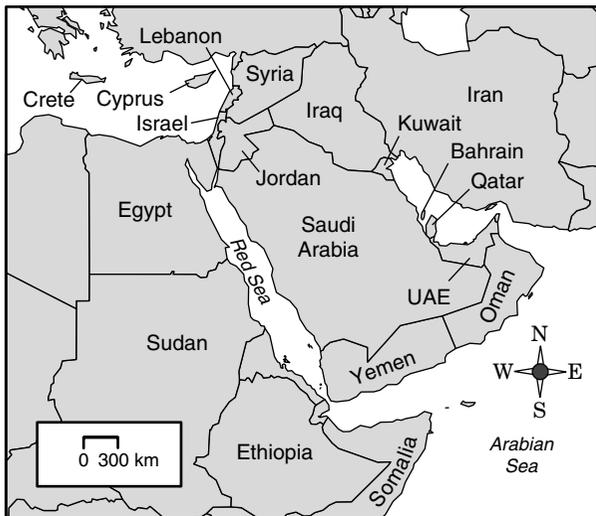
An earthquake struck San Diego, California. The above map and table show that the approximate difference in arrival times between the P-wave and S-wave at Seattle is —

- F 2 minutes
- G 3 minutes
- H 4 minutes
- J 5 minutes

35 The ozone layer protects life on Earth from —

- A ultraviolet rays
- B gamma rays
- C infrared rays
- D x-rays

36



About how long is the Red Sea?

- F 40 km
- G 300 km
- H 1200 km
- J 2100 km

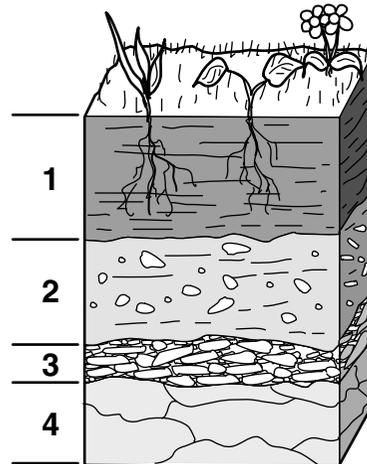
37 All of the following features of the ocean indicate tectonic activity *except* —

- A abyssal plains
- B mid-ocean ridges
- C seamounts
- D trenches

38 Which of these causes days and nights?

- F The orbit of the Earth around the sun
- G The revolution of the moon around the Earth
- H The rotation of the moon on its axis
- J The rotation of the Earth on its axis

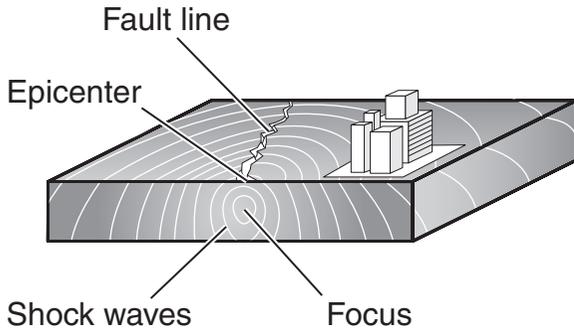
39



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

- A 1
- B 2
- C 3
- D 4

40



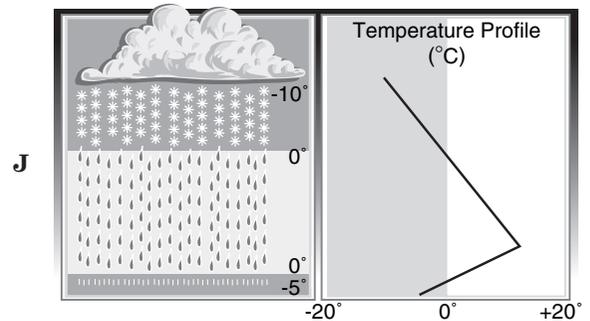
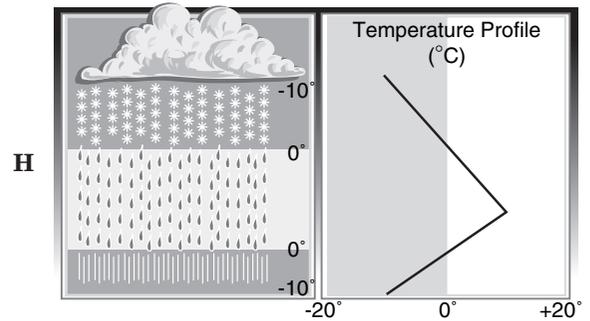
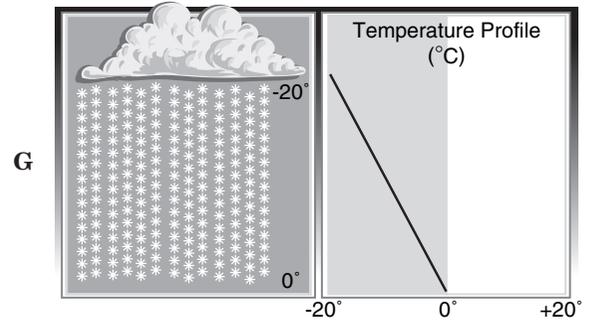
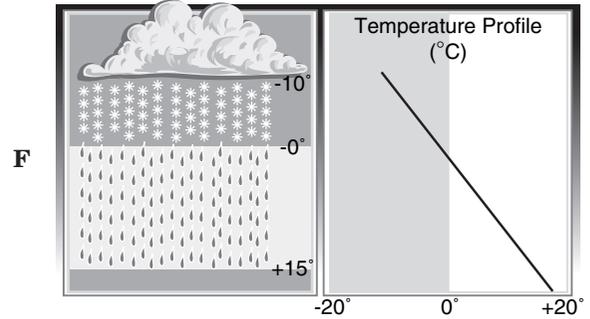
The point from which an earthquake originates is called the —

- F focus
- G epicenter
- H fault line
- J shock wave

41 Which of these facts is the best supporting evidence that the universe is expanding?

- A The stars vary in chemical composition.
- B The galaxies are moving away from each other.
- C The galaxies can spin to form eddies.
- D The universe is filled with galaxies of different sizes.

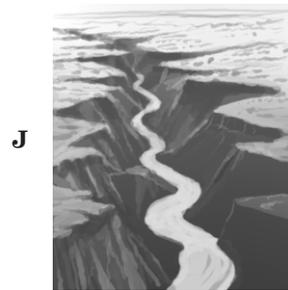
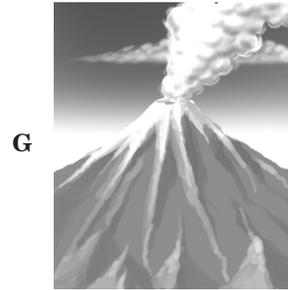
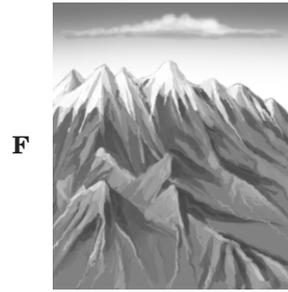
42 In which of the graphs would the precipitation at ground level most likely be rain?



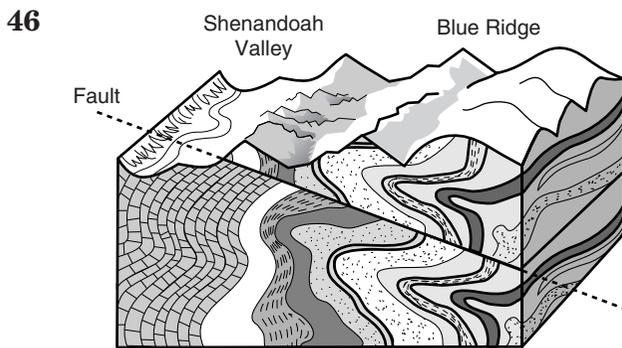
43 Jellyfish have rarely been fossilized because they —

- A contain no carbon compounds
- B are very rare animals
- C are generally found in oceans
- D have soft bodies

44 Which of the landforms is *most* likely to result when two continents collide?



- 45 Why is the surface temperature of the oceans more variable than the water near the ocean floor?
- A Most energy is exchanged at the surface.
  - B Most animals live near the surface.
  - C The water is less dense at the surface.
  - D The salt concentration is more variable at the surface.



More of the upper block's formation is missing mainly due to —

- F lower layers subjected to less pressure
- G erosion of the upper layers' surfaces
- H less deformation than in the lower block
- J presence of more igneous rock in the block

47 More often than metamorphic or igneous rocks, sedimentary rocks have —

- A many holes from trapped gases
- B large quartz crystals
- C numerous fossils
- D a glassy appearance

48 Virginia has large deposits of sand and gravel. These are usually found in areas where —

- F water once flowed
- G lava once covered the ground
- H swamps once were present
- J the water table was once very low

49 Which of these energy sources originates from a nonrenewable resource?

- A Solar
- B Geothermal
- C Fossil fuel
- D Hydroelectric

50 What does Pangaea mean?

- F It is the name of an extinct volcano.
- G It is the French word for volcano.
- H It is the name of an ancient supercontinent.
- J It is a huge disruption of the Earth's atmospheric circulation.

## Answer Key

Test Sequence	Correct Answer	Reporting Category	Reporting Category Description
1	C	002	Geology
2	G	002	Geology
3	B	001	Scientific Investigation
4	H	004	Astronomy and Space Science
5	D	002	Geology
6	G	004	Astronomy and Space Science
7	C	002	Geology
8	H	003	Meteorology, Oceanography, and Groundwater
9	A	002	Geology
10	F	003	Meteorology, Oceanography, and Groundwater
11	C	001	Scientific Investigation
12	H	003	Meteorology, Oceanography, and Groundwater
13	A	003	Meteorology, Oceanography, and Groundwater
14	H	002	Geology
15	C	001	Scientific Investigation
16	J	004	Astronomy and Space Science
17	C	002	Geology
18	F	001	Scientific Investigation
19	C	002	Geology
20	F	004	Astronomy and Space Science
21	B	003	Meteorology, Oceanography, and Groundwater
22	H	002	Geology
23	D	002	Geology
24	J	002	Geology
25	A	004	Astronomy and Space Science
26	F	001	Scientific Investigation
27	A	002	Geology
28	J	002	Geology
29	A	002	Geology
30	J	003	Meteorology, Oceanography, and Groundwater
31	B	002	Geology
32	H	004	Astronomy and Space Science
33	C	001	Scientific Investigation
34	G	001	Scientific Investigation
35	A	003	Meteorology, Oceanography, and Groundwater
36	J	001	Scientific Investigation
37	A	003	Meteorology, Oceanography, and Groundwater
38	J	004	Astronomy and Space Science
39	A	002	Geology
40	F	002	Geology
41	B	004	Astronomy and Space Science
42	F	003	Meteorology, Oceanography, and Groundwater
43	D	002	Geology
44	F	002	Geology
45	A	003	Meteorology, Oceanography, and Groundwater
46	G	002	Geology
47	C	002	Geology
48	F	002	Geology
49	C	002	Geology
50	H	002	Geology