

VIRGINIA
STANDARDS OF LEARNING ASSESSMENTS

Spring 2004 Released Test

END OF COURSE
EARTH SCIENCE
CORE 1

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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

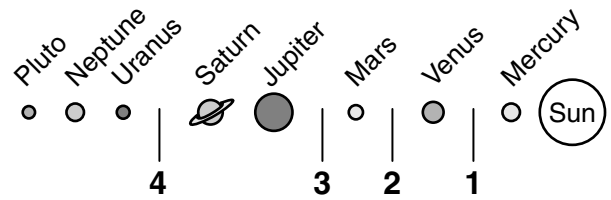
Which of these can be used to measure atmospheric pressure?

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

1 Because of the unique position of the Earth in the solar system, life has flourished due to the presence of —

- A helium
- B volcanoes
- C liquid water
- D salt

2



At what position would Earth be found in the solar system diagram shown above?

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

3 What element is the main component of most stars?

- A Nitrogen
- B Iron
- C Hydrogen
- D Oxygen

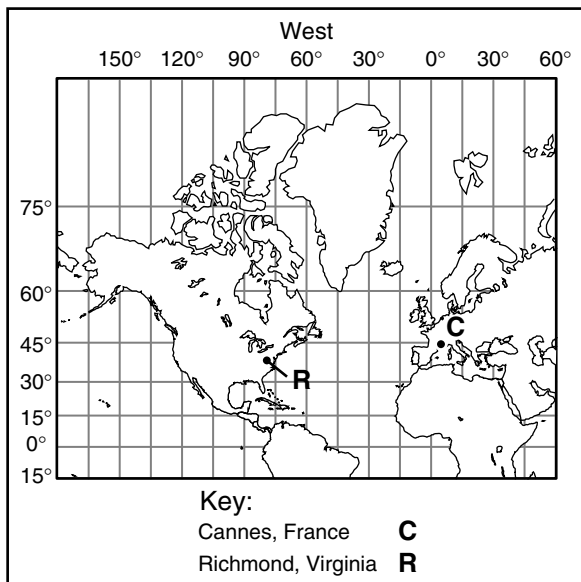
4 The hypothesis for the cause of the dinosaurs' extinction that has the *most* scientific support links their extinction to —

- F a long drought
- G the appearance of man
- H the increase in numbers of mammals
- J a large object from space hitting the Earth

5 Approximately 99.7% of all water on Earth is found in oceans, seas, ice, and the atmosphere. Based on this information, which statement is *most accurate*?

- A The Earth's freshwater supply is infinite.
- B Less than 0.3% of Earth's water is drinkable.
- C Humans are not dependent on ocean water.
- D The water cycle returns all usable water to the sea.

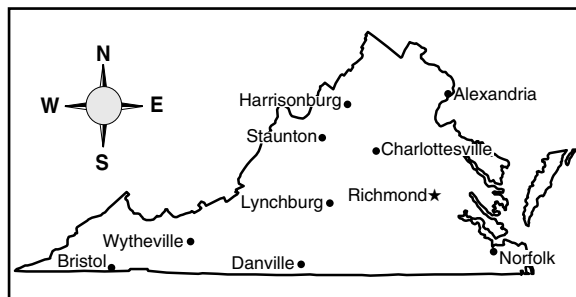
6



The longitude of Richmond, Virginia, on the above map is approximately —

- F 75° W
- G 38° N
- H 38° W
- J 75° N

7



In what direction is Staunton from Richmond?

- A Northeast
- B Northwest
- C Southeast
- D Southwest

8 During which portion of the Earth's revolution around the sun is the Northern Hemisphere tilted toward the sun?

- F Vernal equinox
- G Summer solstice
- H Autumnal equinox
- J Winter solstice

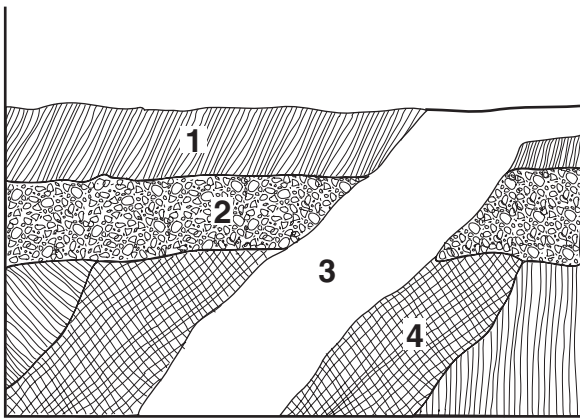
9 What is the best evidence that many different geologic periods are represented in Virginia?

- A The length of its rivers
- B The location of the Piedmont
- C The presence of fossils of different ages
- D The amount of chemical weathering

10 Volcanic ash has occasionally formed molds of animals. This occurs when the ash covers the animal and —

- F replaces the animal's soft tissues
- G enters the animal's body cavity
- H hardens before the animal decays
- J mineralizes the animal's bones

11



Which area is most likely the oldest section of rock?

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

12 Rock layers tell a story about their past. What is the basic assumption that is made when reading this story?

- F The composition of the Earth's atmosphere has been constant.
- G The Earth's crust cooled and then remelted before rock layers began to form.
- H The processes in the rock cycle were the same in the past as they are today.
- J Chemical reactions in the past were slower than they are today.

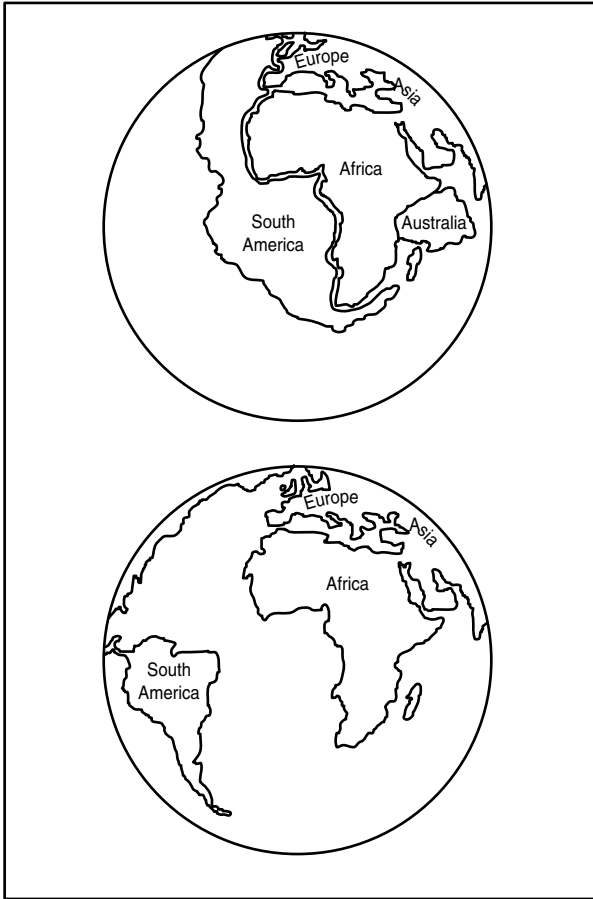
13 A rain forest is found at the base of Mt. Kilimanjaro, and the summit is snowcapped. Which of the following would *best* account for this?

- A Temperature differences due to elevation changes
- B Climate differences due to seasonal changes
- C Differences in precipitation due to formation of a rain shadow
- D Climate changes due to changes in latitude

14 Which of the following was primarily responsible for the development of life outside of the oceans?

- F A decrease in atmospheric hydrogen
- G A decrease in atmospheric carbon dioxide
- H An increase in atmospheric nitrogen
- J An increase in atmospheric oxygen

15



The diagram above is similar to one drawn by Antonio Snider-Pelligrini in 1858. What data was he trying to explain with this diagram?

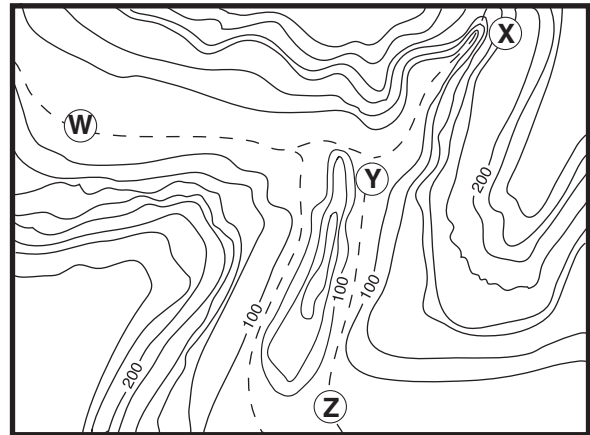
- A The distance between the Eastern and Western Hemispheres
- B The reason for similar fossils in Africa and South America
- C The presence of earthquakes on different continents
- D The variations in depths of the Atlantic Ocean

16 Why do stars appear to change position during the night?

- F Earth rotates on its axis.
- G Earth revolves around the sun.
- H The stars are moving away from each other.
- J Stars are very far away from the solar system.

17

Trail Map



At what point will the trail be the steepest?

- A W
- B X
- C Y
- D Z

18 Which of the following is a renewable source of energy?

- F Natural gas
- G Coal
- H Oil
- J Falling water

- 19 **When the sea floor spreads apart, volcanoes and ridges are formed because —**
- A sediments are deposited where the floor spreads, building ridges
 - B as the plates pull apart, magma moves to the surface, building ridges
 - C ocean water pushes down on the surrounding sea floor, pushing up ridges
 - D underwater earthquakes lift the sea floor into long ridges

- 20 **Which of these would most likely occur as the ice caps melt?**
- F The Earth would become cooler.
 - G The sea would cover more land.
 - H The rivers would flow more rapidly.
 - J The rain would be more acidic.

21 **Mohs Hardness Scale**

Scale Number	Mineral
1	Talc
2	Gypsum
3	Calcite
4	Fluorite
5	Apatite
6	Orthoclase
7	Quartz
8	Topaz
9	Corundum
10	Diamond

The chart shows the Mohs scale for measuring the hardness of minerals. A mineral that can scratch fluorite and can be scratched by orthoclase is able to —

- A scratch both calcite and quartz
 - B be scratched by both calcite and quartz
 - C scratch calcite and be scratched by quartz
 - D scratch quartz and be scratched by calcite
- 22 **Cyanite (Al_2SiO_5), quartz (SiO_2), and leucite (KAlSi_2O_6) may be grouped together because they all contain —**
- F aluminum
 - G carbon
 - H potassium
 - J silicon

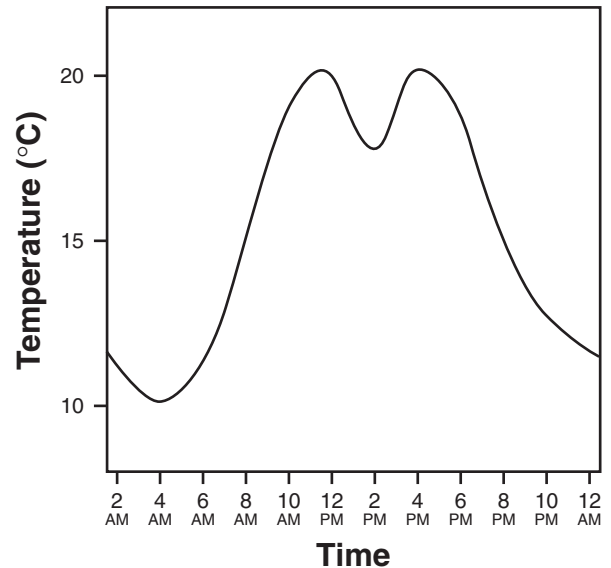
Igneous Rocks

Type of Magma/Lava	Intrusive	Extrusive
Basaltic	Gabbro	Basalt, scoria
Andesitic	Diorite	Andesite
Granitic	Granite	Rhyolite, pumice, obsidian

Of these igneous rocks, which would contain the *largest* crystals?

- A Granite
- B Obsidian
- C Pumice
- D Rhyolite

Outdoor Temperatures for July 15



The graph shows the outdoor temperature at a certain location during a 24-hour period. What possible occurrence happened at 2:00 P.M.?

- F Daylight-savings time
- G Eclipse of the moon
- H A solar storm
- J Thunderstorm passes

25 One method of lessening the environmental impact of strip mining is to —

- A mine only nontoxic materials
- B only mine during the evening hours
- C feed the animals displaced by the mine
- D require that the landscape and vegetation of mined lands be restored

26 By increasing the height of smokestacks, industries in the Midwest reduced the local concentration of air pollutants. However, the pollution was carried by wind to the Northeast where it contributed significantly to —

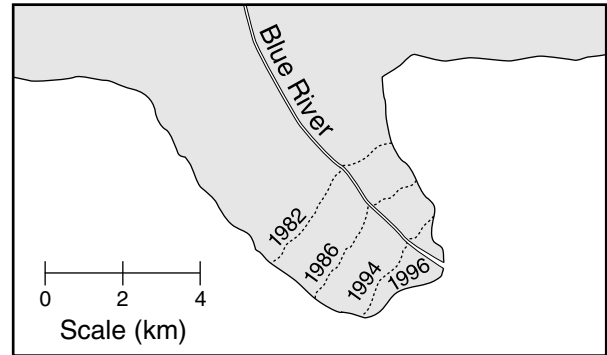
- F reduced rainfall
- G soil erosion
- H mass wasting
- J acid rain

27 Which of the following best explains the rolling topography of the Valley and Ridge province in Virginia?

- A Folding and differential erosion
- B Block faulting of marine sediments
- C Ocean currents and uplift
- D Rifting and ocean waves

28

Growth of a Delta



By how much has the length of the delta increased from 1982 to 1996?

- F 2 km
- G 4 km
- H 6 km
- J 8 km

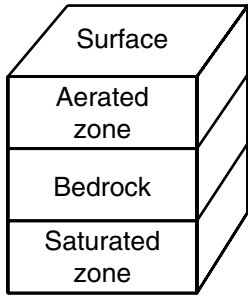
29 The fossil fuel found in *greatest* abundance in Virginia is —

- A oil
- B coal
- C natural gas
- D methane

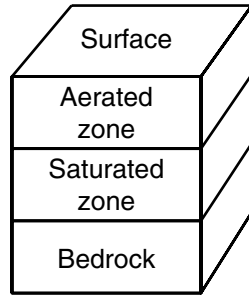
30 Which of the following is *not* considered a result of the movement of tectonic plates?

- F Earthquakes
- G Mountain ranges
- H Increased volcanic activity
- J Karst topography

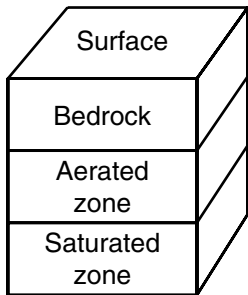
31 Which diagram below best represents the most common arrangement of zones in a water table?



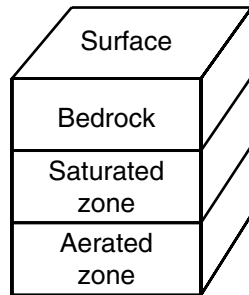
A



C



B



D

32 Students want to identify a rock in a nearby field. Which of the following properties would be *most* useful in identifying the unknown rock?

- F Color
- G Smell
- H Mineral content
- J Specific weight

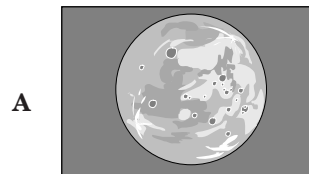
33 What is located beneath soil layers?

- A Bedrock
- B Humus
- C Lava
- D Tundra

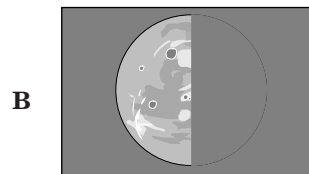
34 Organic matter in soil is made from —

- F weathered parent rock
- G decayed plants and animals
- H acid rain
- J carbon dioxide

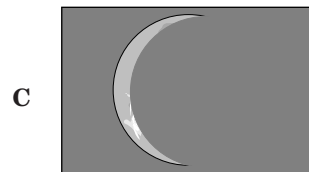
35 During which of these phases of the moon will the tides be highest?



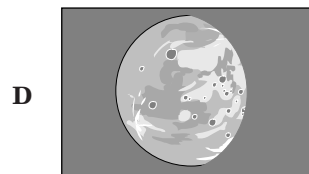
Full Moon



Quarter Moon



Crescent Moon



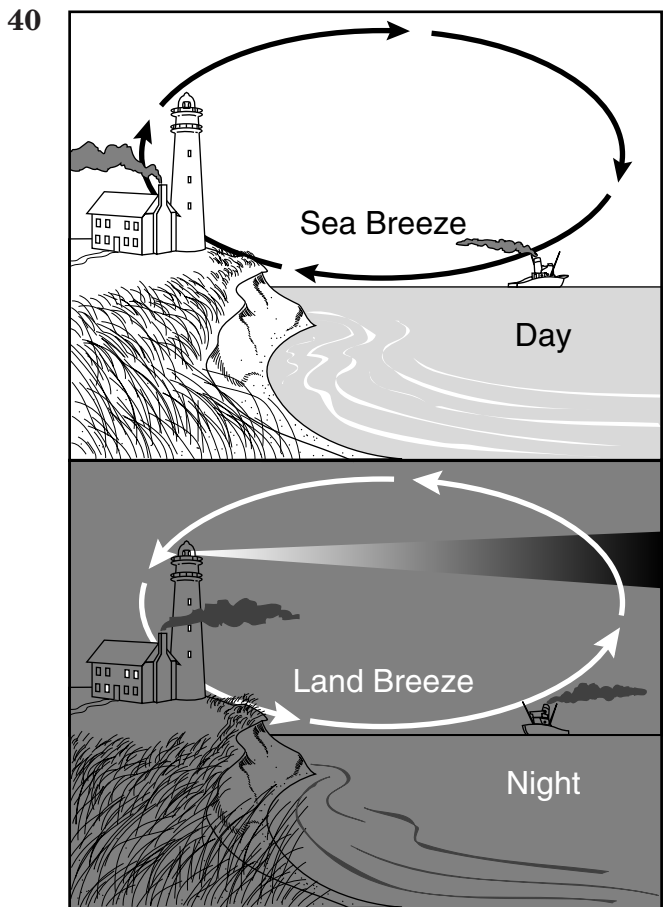
Gibbous Moon

- 36 On clear nights in late summer and early fall in the Shenandoah Valley, why does ground fog form in the low areas near the Shenandoah River?
- F Cool, descending air meets moist air in the low areas near the river.
 - G Cool, moist air ascends from the river to the hilltops.
 - H Warm winds bring moisture from the hills down into the valley.
 - J There is more air pollution in the evenings.

- 37 Why does erosion not occur on the moon?
- A The rock surface of the moon is too hard.
 - B There is no animal life.
 - C There is no wind or rain.
 - D The gravitational pull of the moon is too weak.

- 38 Which planet has a fierce hurricane-like storm that is several times the size of Earth?
- F Mars
 - G Venus
 - H Saturn
 - J Jupiter

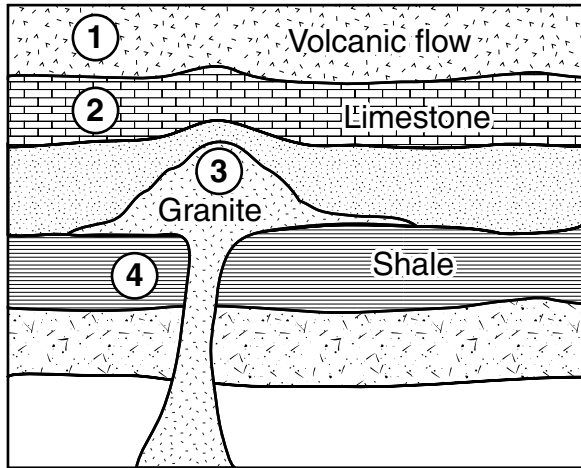
- 39 Which of these provides the *best* evidence of the environment in which an igneous rock was formed?
- A Thickness
 - B Color
 - C Size
 - D Texture



What would explain the change in the direction of air movement from daytime to night?

- F Water is always cooler than land.
- G Land temperature changes more quickly than water temperature.
- H Cool air rises more quickly than warm air.
- J The sun warms the moist ocean air more than the dry land air.

41

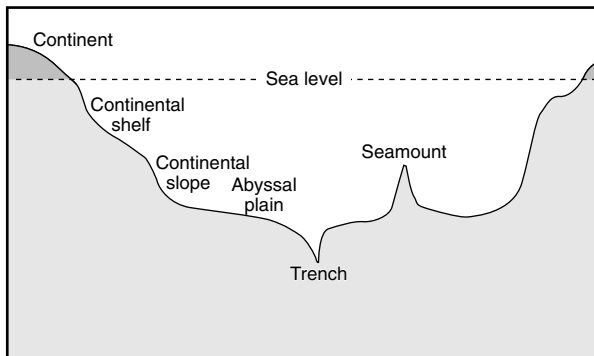


In the illustration shown, which layer is an example of an intrusion?

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

42

The Ocean Floor



At which ocean feature would the greatest amount of water pressure be exerted?

- F Continental shelf
- G Continental slope
- H Abyssal plain
- J Trench

43 A group of students wants to make a map of a small lake, showing its depth at various points. They plan to row their boat all around the lake and measure the depth at different locations. What other information besides depth should they record at each location in order to have enough data for constructing the map?

- A The temperature at the surface of the water at each location
- B The position of each depth measurement relative to fixed points on the shore
- C The time of day the depth was measured at each location
- D The relative humidity at each location

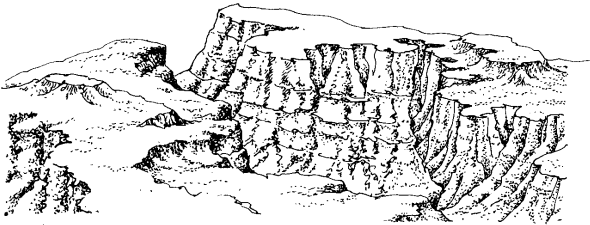
44 In 1912, an astronomer at Arizona's Lowell Observatory noticed that the lines in the spectra of most galaxies shifted toward the red end of the spectrum. Another American astronomer, Edwin Hubble, later interpreted this discovery as evidence that —

- F galaxies were once part of one huge megagalaxy
- G an explosion will one day result from the pressure building as the galaxies expand
- H galaxies are moving away from each other in a constantly expanding universe
- J the largest galaxies are slowly engulfing their smaller neighbors

45 Rocks formed by the cementing of weathered materials are called —

- A sedimentary rocks
- B extrusive igneous rocks
- C basalt
- D magma

46



The canyon shown in the picture was most likely formed by —

- F a volcano
- G high winds
- H earthquakes
- J running water

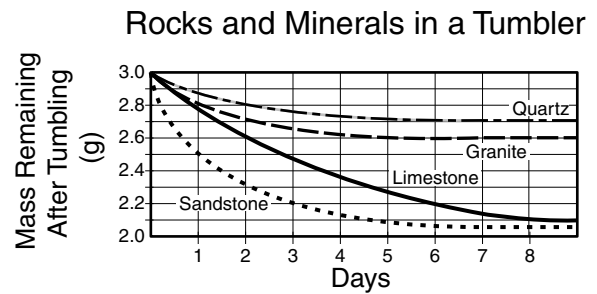
47 What process has occurred when atoms combine to form a new element and release energy?

- A Fusion
- B Fission
- C Hydrogenation
- D Ionization

48 Which of these substances plays the *most* important part in chemical weathering?

- F Wind
- G Water
- H Ice
- J Frost

49



How much limestone was worn away between Day 1 and Day 2?

- A 0.2 gram
- B 2.3 grams
- C 2.5 grams
- D 2.8 grams

50 Extrusive rocks have small grains because they —

- F cool quickly
- G harden underground
- H contain rare minerals
- J have a rough mixture

Answer Key

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