**PRELUDE: And Just What Is Geology?**

**MULTIPLE CHOICE**

1. What is the study of the Earth called?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | biology | c. | geology |
| b. | chemistry | d. | physics |

ANS: C DIF: Easy REF: PRE.2

OBJ: PRE. A. Describe the scope and applications of geology. MSC: Understanding

2. Which of the following newsworthy topics is LEAST related to an aspect of geology?

|  |  |
| --- | --- |
| a. | a major earthquake in Turkey |
| b. | the eruption of a volcano in Mexico |
| c. | the collapse of a building in New York |
| d. | a mudslide in Santa Barbara, California |

ANS: C DIF: Moderate REF: PRE.2

OBJ: PRE. A. Describe the scope and applications of geology. MSC: Evaluating

3. \_\_\_\_\_\_\_\_\_\_\_\_ is a subdiscipline of geoscience that involves the study of the physical properties, structure, and chemical behavior of minerals.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Petrology | c. | Volcanology |
| b. | Mineralogy | d. | Paleontology |

ANS: B DIF: Easy REF: PRE.2

OBJ: PRE. B. Explain the foundational themes of modern geologic study.

MSC: Remembering

4. \_\_\_\_\_\_\_\_\_\_\_\_ is a subdiscipline of geoscience that involves the study of rocks and their formation.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Petrology | c. | Volcanology |
| b. | Mineralogy | d. | Paleontology |

ANS: A DIF: Easy REF: PRE.2

OBJ: PRE. B. Explain the foundational themes of modern geologic study.

MSC: Remembering

5. The subdiscipline of geology that is concerned with landscape formation and evolution is called which of the following?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | geomorphology | c. | petrology |
| b. | geochemistry | d. | seismology |

ANS: A DIF: Moderate REF: PRE.2

OBJ: PRE. B. Explain the foundational themes of modern geologic study.

MSC: Analyzing

6. The Earth is \_\_\_\_\_\_\_ years old.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 4.56 million | c. | 13.8 billion |
| b. | 4.56 billion | d. | 14.5 billion |

ANS: B DIF: Moderate REF: PRE.3

OBJ: PRE. B. Explain the foundational themes of modern geologic study.

MSC: Remembering

7. The \_\_\_\_\_\_\_\_\_\_\_\_\_ is the division of geologic time that ended 541 million years ago.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Precambrian | c. | Paleozoic |
| b. | Phanerozoic | d. | Cenozoic |

ANS: A DIF: Moderate REF: PRE.3

OBJ: PRE. B. Explain the foundational themes of modern geologic study.

MSC: Applying

8. \_\_\_\_\_\_\_\_ is/are driven by heat within the Earth. Plate movement is a good example.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Gravity | c. | External processes |
| b. | Internal processes | d. | Kinetic energy |

ANS: C DIF: Easy REF: PRE.3

OBJ: PRE. D. Provide a basic definition of the theory of plate tectonics.

MSC: Applying

9. Which source of energy is MOST likely responsible for plate tectonic movements?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | gravity | c. | external energy |
| b. | internal energy | d. | potential energy |

ANS: B DIF: Moderate REF: PRE.3

OBJ: PRE. D. Provide a basic definition of the theory of plate tectonics.

MSC: Applying

10. What is the main source of external energy to the Earth System?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | gravity | c. | radioactive decay |
| b. | convection | d. | the Sun |

ANS: D DIF: Easy REF: PRE.3

OBJ: PRE. D. Provide a basic definition of the theory of plate tectonics.

MSC: Understanding

11. The theory that describes the movement of the Earth’s crust and the consequences of that movement is called

|  |  |  |  |
| --- | --- | --- | --- |
| a. | plate tectonics. | c. | geophysical flux. |
| b. | expanding Earth theory. | d. | geologic time. |

ANS: A DIF: Easy REF: PRE.3

OBJ: PRE. D. Provide a basic definition of the theory of plate tectonics.

MSC: Applying

12. Groundwater is part of which realm?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | geosphere | c. | biosphere |
| b. | hydrosphere | d. | atmosphere |

ANS: B DIF: Moderate REF: PRE.3

OBJ: PRE. E. Explain what geologists mean by the Earth System concept.

MSC: Applying

13. Glaciers are part of which component of the Earth System?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | geosphere | c. | biosphere |
| b. | cryosphere | d. | atmosphere |

ANS: B DIF: Moderate REF: PRE.3

OBJ: PRE. E. Explain what geologists mean by the Earth System concept.

MSC: Applying

14. Rivers are part of which component of the Earth System?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | geosphere | c. | biosphere |
| b. | hydrosphere | d. | atmosphere |

ANS: B DIF: Moderate REF: PRE.3

OBJ: PRE. E. Explain what geologists mean by the Earth System concept.

MSC: Applying

15. The geosphere includes all of the following EXCEPT the

|  |  |  |  |
| --- | --- | --- | --- |
| a. | mantle. | c. | cryosphere. |
| b. | crust. | d. | core. |

ANS: C DIF: Easy REF: PRE.3

OBJ: PRE. E. Explain what geologists mean by the Earth System concept.

MSC: Understanding

16. The condensation of water vapor in the atmosphere and subsequent transfer to the ocean via precipitation is an example of a(n)

|  |  |  |  |
| --- | --- | --- | --- |
| a. | cycle. | c. | method. |
| b. | system. | d. | hypothesis |

ANS: A DIF: Moderate REF: PRE.3

OBJ: PRE. E. Explain what geologists mean by the Earth System concept.

MSC: Analyzing

17. The interconnected web of interacting materials and processes on the Earth is known as the

|  |  |  |  |
| --- | --- | --- | --- |
| a. | tectonic cycle. | c. | hydrosphere. |
| b. | geosphere. | d. | Earth system. |

ANS: D DIF: Easy REF: PRE.3

OBJ: PRE. E. Explain what geologists mean by the Earth System concept.

MSC: Remembering

18. The \_\_\_\_\_\_\_\_\_\_\_\_\_ is the semirigid layer of the Earth that encompasses the crust and uppermost portion of the mantle.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | lithosphere | c. | geosphere |
| b. | asthenosphere | d. | mesosphere |

ANS: A DIF: Difficult REF: PRE.3

OBJ: PRE. F. Name the main layers of the Earth’s interior. MSC: Analyzing

19. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a soft layer of the upper mantle.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | lithosphere | c. | geosphere |
| b. | asthenosphere | d. | mesosphere |

ANS: B DIF: Easy REF: PRE.3

OBJ: PRE. F. Name the main layers of the Earth’s interior. MSC: Analyzing

20. From center to surface, our planet has the following layers:

|  |  |  |  |
| --- | --- | --- | --- |
| a. | core-crust-mantle. | c. | crust-mantle-core. |
| b. | core-mantle-crust. | d. | mantle-core-crust. |

ANS: B DIF: Moderate REF: PRE.3

OBJ: PRE. F. Name the main layers of the Earth’s interior. MSC: Understanding

21. What system divides the Earth history into intervals?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | geologic time scale | c. | geochronological index |
| b. | universal time scale | d. | isotopic measurement scale |

ANS: A DIF: Easy REF: PRE.3 | Box P.1

OBJ: PRE. B. Explain the foundational themes of modern geologic study.

MSC: Applying

22. Scientists guide their work using a sequence of steps for systematically analyzing scientific problems in a way that leads to verifiable results. This sequence is called the

|  |  |  |  |
| --- | --- | --- | --- |
| a. | elemental method. | c. | hypothesis. |
| b. | scientific method. | d. | theory. |

ANS: B DIF: Easy REF: PRE.3 | Box P.1

OBJ: PRE. C. Demonstrate how geologists employ the scientific method.

MSC: Remembering

23. Which of the following statements is MOST true of a scientific theory?

|  |  |
| --- | --- |
| a. | *Theory* is a scientific word for a hypothesis. |
| b. | A scientific theory is a new idea, yet to be tested. |
| c. | Scientific theories are truths that are too theoretical to be tested directly. |
| d. | A theory is a scientific idea supported by an abundance of evidence. |

ANS: D DIF: Difficult REF: PRE.3 | Box P.1

OBJ: PRE. C. Demonstrate how geologists employ the scientific method.

MSC: Understanding

24. Which of the following is MOST true of hypotheses in science?

|  |  |
| --- | --- |
| a. | A hypothesis is a possible natural explanation that can explain a set of data. |
| b. | A hypothesis must be delineated before the start of any scientific endeavor. |
| c. | A hypothesis is a scientific idea supported by an abundance of evidence. |
| d. | It is important that hypotheses are proved correct. |

ANS: A DIF: Difficult REF: PRE.3 | Box P.1

OBJ: PRE. C. Demonstrate how geologists employ the scientific method.

MSC: Understanding

25. Which of the following is MOST true of a scientific law?

|  |  |
| --- | --- |
| a. | A scientific law is a possible explanation that can explain a set of data. |
| b. | A scientific law describes a specific relationship or phenomenon. |
| c. | A law is a scientific idea supported by an abundance of evidence. |
| d. | A scientific law explains why a natural phenomenon occurs. |

ANS: B DIF: Difficult REF: PRE.3 | Box P.1

OBJ: PRE. C. Demonstrate how geologists employ the scientific method.

MSC: Understanding

**SHORT ANSWER**

1. Where does geologic discovery take place? Where do geologists typically work?

ANS:

Geologic discovery takes place in the field, in laboratories, and in many other, often unique locations using a variety of types of technology and sophisticated instruments. Geologists may find themselves working in a wide array of professional positions spanning many subdisciplines. For example, they may work in an academic or research setting or in a range of industry-related jobs. They may also work for local/state/federal agencies or as individual consultants. These are just a few examples of what geologists might do professionally.

DIF: Easy REF: PRE.1

OBJ: PRE. A. Describe the scope and applications of geology. MSC: Applying

2. Describe some of the reasons a person might want to study geology.

ANS:

First, geology is a highly practical subject—one that provides relevant answers to things that impact everyday life. Second, the study of geology provides awareness of the planet that few other disciplines can. Third, the study of geology puts the accomplishments and consequences of human society in context. Finally, the study of geology may change your view of the world to one augmented with geologic curiosity.

DIF: Easy REF: PRE.2

OBJ: PRE. A. Describe the scope and applications of geology. MSC: Understanding

3. Scientists use the scientific method to guide their work. List the steps used in the scientific method.

ANS:

The basic steps of the scientific method are: recognize the problem; collect data; propose hypotheses; and test hypotheses.

DIF: Difficult REF: PRE.3 | Box P.1

OBJ: PRE. C. Demonstrate how geologists employ the scientific method.

MSC: Analyzing

4. Geology is a synthesis of many sciences. Explain why this is true.

ANS:

The study of geology is interdisciplinary in its very nature and is useful for understanding other disciplines of physical science. Geology applies basic concepts of physics, chemistry, and biology. As you learn about the Earth, you may also learn about fundamental topics such as the behavior of matter and energy and the nature of chemical reactions.

DIF: Moderate REF: PRE.3

OBJ: PRE. B. Explain the foundational themes of modern geologic study.

MSC: Applying

5. The geosphere encompasses the solid Earth. Explain how the Earth System consists of more than just the geosphere.

ANS:

The Earth System consists of a number of interconnected realms in addition to and beyond the geosphere, which includes the solid Earth. Other important realms in the Earth System include the hydrosphere (water), the cryosphere (ice), the atmosphere (gaseous envelope surrounding Earth), and the biosphere, which includes life on the planet.

DIF: Moderate REF: PRE.3

OBJ: PRE. E. Explain what geologists mean by the Earth System concept.

MSC: Analyzing