

Chapter 01

Introducing Geology, the Essentials of Plate Tectonics, and Other Important Concepts

True / False Questions

1. We depend on geologists for the raw materials we need for survival.

TRUE

Bloom's Level: 1. Remember

2. Most deaths associated with volcanic eruptions are due to burns of lava flows.

FALSE

Bloom's Level: 1. Remember

3. A tsunami has a small wave height, travels rapidly, and is not noticed by people in boats.

TRUE

Bloom's Level: 1. Remember

Topic: Earthquakes

Topic: Shorelines

4. While the reserves of petroleum hydrocarbons within the United States are limited, other geologic resources (iron, aluminum, copper, and tin) are available in great abundance.

FALSE

Topic: Mineral Resources

5. Geology uses the scientific method to explain natural aspects of the Earth.

TRUE

Bloom's Level: 1. Remember

Topic: Nature of Geology

6. Deeply buried rock that is hot and under pressure can deform like taffy or putty.

TRUE

*Bloom's Level: 2. Understand
Topic: Metamorphism*

7. Ocean - ocean plate convergence formed major mountain belts such as the Andes and Cascades.

FALSE

*Bloom's Level: 1. Remember
Topic: Plate Tectonics*

8. The mantle is the most voluminous of Earth's three major concentric zones.

TRUE

*Bloom's Level: 1. Remember
Topic: Earth's Interior*

9. Earth's lithosphere is made up of the uppermost part of the mantle and crust.

TRUE

*Bloom's Level: 1. Remember
Topic: Earth's Interior*

10. Understanding geology can help us lessen or prevent damage to the environment.

TRUE

*Bloom's Level: 2. Understand
Topic: Nature of Geology*

11. Most convergent plate boundaries coincide with the crests of submarine mountain ranges called mid-oceanic ridges.

FALSE

*Bloom's Level: 2. Understand
Topic: Plate Tectonics*

12. Plate tectonics regards the lithosphere as divided into segments (plates) that are in horizontal motion.

TRUE

*Bloom's Level: 1. Remember
Topic: Plate Tectonics*

13. A transform plate boundary occurs where two plates converge.

FALSE

*Bloom's Level: 1. Remember
Topic: Plate Tectonics*

14. Convergent boundaries, due to their geometry, are the sites of the largest earthquakes on Earth.

TRUE

*Bloom's Level: 2. Understand
Topic: Plate Tectonics*

15. After the opening of the North Slope in Alaska the U.S. stopped importing petroleum.

FALSE

*Bloom's Level: 1. Remember
Topic: Energy Resources*

16. The North American Plate is all on one plate.

TRUE

Bloom's Level: 1. Remember
Topic: Plate Tectonics

17. Rocks formed at high temperatures and under high pressure deep within the Earth and pushed upward by tectonic force are stable in their new environment.

FALSE

Bloom's Level: 2. Understand
Topic: Metamorphism

18. Rocks brought to the earth's surface by internal processes are worn down, and eroded by surficial processes.

TRUE

Bloom's Level: 1. Remember
Topic: Erosion

19. The Earth is about 4.6 billion years old.

TRUE

Bloom's Level: 1. Remember
Topic: Geologic Time

20. The Earth can be considered as interrelated systems or spheres.

TRUE

Bloom's Level: 2. Understand
Topic: Nature of Geology

Multiple Choice Questions

21. The Earth's system that includes the oceans, rivers, lakes, and glaciers of the world is called the _____.

- A. biosphere
- B. hydrosphere**
- C. atmosphere
- D. geosphere
- E. solid Earth

Bloom's Level: 1. Remember
Topic: Nature of Geology

22. The _____ and the Alpine Fault of New Zealand are examples of transform plate boundaries.

- A. New Madrid Fault of Arkansas
- B. Choctaw Fault of Oklahoma
- C. San Andreas Fault of California**
- D. East African Rift
- E. Rio Grande Rift

Bloom's Level: 2. Understand
Topic: Deformation
Topic: Plate Tectonics

23. A _____ is a huge ocean wave usually caused by a displacement of the sea floor and commonly associated with massive earthquakes.

- A. S-wave
- B. tidal wave
- C. tsunami**
- D. seiche
- E. breaker

Bloom's Level: 1. Remember
Topic: Earthquakes

24. A ____ is a hot, turbulent mixture of expanding gases and volcanic ash that flows rapidly down the side of a volcano.

- A. pyroclastic cloud
- B. mud flow
- C. lava flow
- D. pyroclastic flow**
- E. hyaloclastic flow

Bloom's Level: 1. Remember

Topic: Igneous Environments

Topic: Volcanoes and Volcanic Hazards

25. Eruptive activity at the summit of the Nevada del Ruiz volcano in Colombia in 1985 caused snow and ice to melt, generating a ____ that killed 23,000 people in the village of Armero.

- A. gas cloud
- B. mud flow**
- C. lava flow
- D. pyroclastic flow
- E. hyaloclastic flow

Bloom's Level: 1. Remember

Topic: Unstable Slopes

Topic: Volcanoes and Volcanic Hazards

26. To understand geology one must understand how the solid Earth interacts with water, air, and living organisms. For this reason, it is useful to think of Earth as being part of a ____.

- A. hydrosphere
- B. system**
- C. trend
- D. group
- E. formation

Bloom's Level: 2. Understand

Topic: Nature of Geology

27. Among other things, geologists are employed as ____.

- A. petroleum geologists
- B. environmental geologists
- C. marine geologists
- D. hydrogeologists
- E.** All of the answers are correct.

Bloom's Level: 1. Remember

28. Rock deep within the Earth is _____ and _____.

- A. hot; heat flows inward toward Earth's center.
- B. cool; heat flows in toward Earth's center
- C.** hot; heat flows out toward Earth's surface
- D. the same temperature throughout the earth; heat flow is not an important consideration
- E. unknown; we can only guess about conditions there

Bloom's Level: 2. Understand

Topic: Igneous Environments

29. Earth's external heat engine is driven by ____.

- A.** solar power
- B. residual cosmic radiation from the Big Bang
- C. the decay of radioactive isotopes
- D. tides
- E. meteor impacts

Bloom's Level: 1. Remember

Topic: Climate, Weather, and Their Influences on Geology

30. ____ refer(s) to the scientific study of Earth.

- A. Hydrology
- B.** Geology
- C. Spheres

Bloom's Level: 1. Remember

Topic: Nature of Geology

31. The Earth's interior heat engine works because hot buoyant material deep within the Earth _____ while cold denser material _____.

- A. moves upward; moves downward
- B. contracts and sinks; expands and rises
- C. contracts and rises; expands and sinks
- D. expand and sinks; contract and rises

Bloom's Level: 2. Understand

Topic: Earth's Interior

32. The _____ is the most voluminous of the Earth's three major concentric zones.

- A. core
- B. mantle
- C. lithosphere
- D. asthenosphere
- E. crust

Bloom's Level: 1. Remember

Topic: Earth's Interior

33. Listed from Earth's center outward, the three concentric zones of Earth are the ____.

- A. crust, mantle, core
- B. mantle, crust, core
- C. core, crust, mantle
- D. mantle, core, crust
- E. core, mantle, crust

Bloom's Level: 1. Remember

Topic: Earth's Interior

34. A _____ is a scientific concept that has been tested and is in all likelihood true.

- A. concept
- B. hypothesis
- C. theory
- D. scenario
- E. belief

Bloom's Level: 1. Remember

Topic: Nature of Geology

35. _____ are geological forces generated inside the Earth.

- A. Surficial forces
- B. Electrochemical forces
- C. Tectonic forces
- D. Inertial
- E. Celestial

Bloom's Level: 1. Remember

Topic: Earth's Interior

36. Earthquakes, volcanic eruptions, landslides, floods, and tsunamis are all examples of:

- A. earth-altering processes.
- B. earth hazards.
- C. geologic resources.
- D. geospheric processes.
- E. geologic hazards

Bloom's Level: 2. Understand

Topic: Unstable Slopes

37. The _____ collectively make up the lithosphere.

- A. the crust and the whole mantle
- B. the crust and the uppermost part of the mantle**
- C. the crust and asthenosphere
- D. the upper and lower mantle
- E. the asthenosphere and the upper mantle

Bloom's Level: 2. Understand

Topic: Earth's Interior

Topic: Plate Tectonics

38. The _____ is soft and therefore flows more readily than the underlying mantle.

- A. crust
- B. asthenosphere**
- C. lithosphere
- D. core
- E. plate

Bloom's Level: 2. Understand

Topic: Earth's Interior

Topic: Plate Tectonics

39. A hypothesis that passes repeated tests ultimately becomes ____.

- A. a guess
- B. an observation of a phenomenon
- C. a first, tentative idea to explain a phenomenon
- D. a theory**
- E. a proven law of nature

Bloom's Level: 1. Remember

Topic: Nature of Geology

40. After data have been analyzed, tentative explanations or solutions called _____ may be proposed.

- A. a guess
- B. an observation of a phenomenon
- C. hypotheses
- D. a concept that has been tested reproducibly and is likely to be true
- E. a proven law of nature

Bloom's Level: 1. Remember
Topic: Nature of Geology

41. Plate tectonics is a unifying idea that helps explain where and why there are ____ on Earth.

- A. earthquakes
- B. volcanoes
- C. mountain belts
- D. oceanic ridges and trenches
- E. All of the answers are correct.

Bloom's Level: 1. Remember
Topic: Plate Tectonics

42. The two major types of crust are oceanic crust and ____.

- A. continental crust
- B. lithosphere
- C. convergent crust
- D. thin crust

Bloom's Level: 1. Remember
Topic: Plate Tectonics

43. Earth can be visualized as a giant machine driven by which of the following engines?

- A. solar and internal
- B. regional and local
- C. expanding and condensing
- D. surficial and heat
- E. buried and exposed

Bloom's Level: 3. Apply
Topic: Earth's Interior
Topic: Nature of Geology

44. The concept of plate tectonics regards the earth's ____ as broken into a number of ____ that are in motion relative to each other.

- A. crust; plates
- B. mantle; plates
- C. asthenosphere; plates
- D. lithosphere; plates
- E. plates; lithosphere

Bloom's Level: 1. Remember
Topic: Earth's Interior
Topic: Plate Tectonics

45. A _____, by scientists definition, is something that has been overwhelmingly verified.

- A. hypothesis
- B. guess
- C. prediction
- D. theory

Bloom's Level: 1. Remember
Topic: Nature of Geology

46. Plates are known to be moving away from each other ____.

- A. across mountain ranges like the Himalayan Mountains
- B. across subduction zones
- C. across mid-ocean ridges
- D. across the stable interior of continents
- E. along transform faults

Bloom's Level: 1. Remember

Topic: Plate Tectonics

47. A _____ boundary occurs where plates move towards one another.

- A. convergent
- B. concurrent
- C. rift
- D. abutting
- E. transform

Bloom's Level: 1. Remember

Topic: Plate Tectonics

48. The _____ of old seafloor takes place at convergent boundaries.

- A. destruction
- B. creation
- C. production
- D. erosion
- E. extinction

Bloom's Level: 1. Remember

Topic: Plate Tectonics

49. The North American plate is moving _____.

- A. north
- B. south
- C. west**
- D. east
- E. nowhere, it's fixed

Bloom's Level: 2. Understand
Topic: Plate Tectonics

50. Where a subducting plate slides beneath the lithosphere, melting takes place and a(n) _____ is created.

- A. plate
- B. ocean trench**
- C. seamount
- D. sedimentary rock
- E. coral reef

Bloom's Level: 2. Understand
Topic: Plate Tectonics

51. Sedimentary rock that becomes deeply buried may be transformed by heat and pressure into _____ rock.

- A. soil
- B. igneous
- C. granite
- D. metamorphic**
- E. All of the answers are correct.

Bloom's Level: 2. Understand
Topic: Metamorphism

52. The product of the breakdown of surface rocks by weathering and erosion is ____.

- A. lava
- B. magma
- C. sediment
- D. quartz
- E. ash

Bloom's Level: 2. Understand

Topic: Weathering

53. With the cementation of loose particles sediment becomes _____.

- A. molten
- B. metamorphic
- C. lithified
- D. igneous
- E. basalt

Bloom's Level: 2. Understand

Topic: Sedimentary Environments

54. _____ takes place where moving water, ice, and wind loosen and remove material on the continents.

- A. Burial
- B. Metamorphism
- C. Melting
- D. Subsidence
- E. Erosion

Bloom's Level: 1. Remember

Topic: Sedimentary Environments

Topic: Weathering

55. Disintegration of rock at Earth's surface may be facilitated by water ____.

- A. flowing on the surface in streams and as runoff
- B. frozen in a glacier that is flowing over the surface
- C. moving through near-surface pores and fractures
- D. present as vapor in the atmosphere
- E.** All of the answers are correct.

Bloom's Level: 2. Understand

Topic: Weathering

56. A(n) ____ may eventually be formed as layers of sediment are buried by subsequent layers of sediment.

- A. igneous rock
- B. metamorphic rock
- C. sedentary rock
- D.** sedimentary rock
- E. foliated rock

Bloom's Level: 2. Understand

Topic: Sedimentary Environments

57. The best geologic data currently available indicates that Earth is approximately ____ years old.

- A. 4,550
- B. 4,550,000
- C.** 4,550,000,000
- D. 4,550,000,000,000
- E. 4,550,000,000,000,000

Bloom's Level: 1. Remember

Topic: Geologic Time

58. Which of the following lifeforms appeared first in the geologic record?

- A. dinosaurs
- B. mammals
- C. plants
- D.** fishes
- E. reptiles

Bloom's Level: 1. Remember
Topic: Geologic Time

59. Fossil evidence indicates that complex life forms, capable of generating easily fossilized hard parts like shells or bones, have existed in abundance on Earth since approximately ____ years ago.

- A. 5,440
- B. 544 thousand
- C.** 544 million
- D. 5,440,000,000
- E. 544,000,000,000

Bloom's Level: 1. Remember
Topic: Geologic Time

60. Fossil evidence indicates that dinosaurs became extinct approximately ____ years ago.

- A. 65 thousand
- B. 650 thousand
- C. 6,500,000
- D.** 65 million
- E. 650,000,000

Bloom's Level: 1. Remember
Topic: Geologic Time