

Chapter 02 - Investigating Geologic Questions

**Chapter 02**  
**Investigating Geologic Questions**

**Multiple Choice Questions**

1. What was the main mystery described for the Mediterranean Sea?
- A. A volcanic eruption destroyed the ancient city of Alexandria.
  - B. A meteorite formed the western Mediterranean Sea.
  - C. The Mediterranean dried up and deposited layers of salt.**
  - D. A large landmass collapsed downward, forming the sea.

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.0*

*Topic: Investigating Geologic Questions*

2. Which locations are composed of loose materials (not bedrock)?



- A. 1 and 2
- B. 2 and 3
- C. 3 and 4**
- D. 1 and 3
- E. 2 and 4

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.1*

*Topic: Nature of Geology*

Chapter 02 - Investigating Geologic Questions

3. Which location(s) have loose, angular rocks?



- A. 1
- B. 2
- C. 3**
- D. 4
- E. 1 and 2

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.1*

*Topic: Nature of Geology*

4. Which locations contain rocks that are in place (part of the bedrock)?



- A. 1 and 2**
- B. 2 and 3
- C. 3 and 4
- D. 1 and 3
- E. 2 and 4

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.1*

*Topic: Nature of Geology*

5. Which locations consist of sediment rather than sedimentary rocks?



- A. 1 and 2
- B. 2 and 3
- C. 3 and 4
- D. 1 and 3
- E. 2, 3, and 4

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.1*

*Topic: Nature of Geology*

6. What are some components of the landscape shown in this photograph?



- A. a natural stain on the outside of the rocks
- B. fractures and layers
- C. loose rocks covering a slope-forming unit
- D. rounding of the upper parts of the cliff
- E.** all of these

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.1*

*Topic: Investigating Geologic Questions*

7. Which of the following is NOT a recommended strategy for observing a landscape?

- A. Observe the entire landscape first and then focus on smaller parts, one part at a time.
- B.** Examine complexities of each feature rather than grouping features into types.
- C. Focus on one type of feature at a time, noting where this type of feature is present.
- D. Examine relationships between different features.

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.1*

*Topic: Investigating Geologic Questions*

8. The sediment in this photograph most likely formed in:



- A. a steep mountain front
- B.** a river
- C. a sand dune
- D. deep water conditions on the seafloor

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.2*

*Topic: Nature of Geology*

9. The sediment in this photograph mostly likely formed in:



- A.** a steep mountain front
- B. a river
- C. a sand dune
- D. deep water conditions on the seafloor

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.2*

*Topic: Nature of Geology*

10. The rock in this photograph mostly likely formed in:



- A. a steep mountain front
- B.** a river
- C. a sand dune
- D. deep water conditions on the seafloor

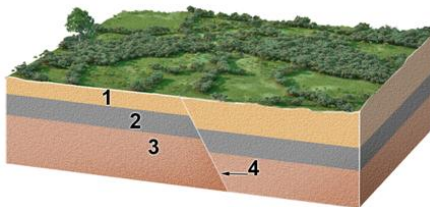
*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.2*

*Topic: Nature of Geology*

11. What is the youngest unit or feature in this figure?



- A. 1
- B. 2
- C. 3
- D.** 4
- E. there is no way to tell

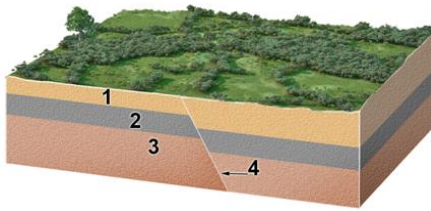
*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.2*

*Topic: Nature of Geology*

12. What is the oldest unit or feature in this figure?



- A. 1
- B. 2
- C. 3**
- D. 4
- E. there is no way to tell

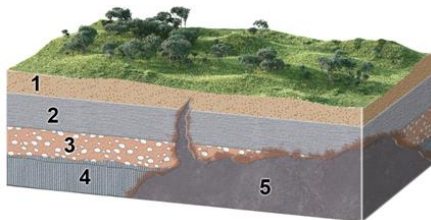
*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.2*

*Topic: Nature of Geology*

13. What is the oldest unit or feature in this figure?



- A. 1
- B. 2
- C. 3
- D. 4**
- E. 5

*Difficulty Level: Analyze*

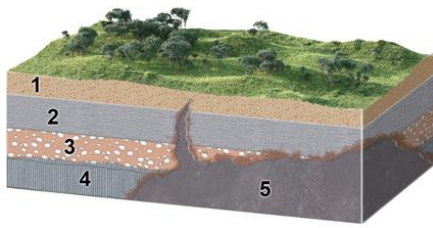
*Difficulty Level: Apply*

*Section: 2.2*

*Topic: Nature of Geology*



14. What is the youngest unit or feature in this figure?



- A. 1
- B. 2
- C. 3
- D. 4
- E. 5**

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.2*

*Topic: Nature of Geology*

15. The youngest unit or feature in this photograph is:



- A.** the rock at the top that contains angular fragments
- B. the gray layer in the middle of the photograph
- C. the tilted rocks at the bottom
- D. there is no way to tell

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.2*

*Topic: Nature of Geology*



16. The oldest unit or feature in this photograph is:



- A. the rock at the top that contains angular fragments
- B. the gray layer in the middle of the photograph
- C.** the tilted rocks at the bottom
- D. there is no way to tell

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.2*

*Topic: Nature of Geology*

17. What strategy was described for inferring the environment in which a rock formed?

- A. smashing the rock into pieces to see whether it breaks into square or rounded pieces
- B.** comparing the characteristics of the rock to deposits from modern environments
- C. imagining what would happen if the rock was metamorphosed
- D. all of these

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.2*

*Topic: Investigating Geologic Questions*

18. The phrase *trading location for time* signifies that:

- A. It takes more time to observe a landscape than is available.
- B. Expensive homes are built in locations that cost people time.
- C. Different parts of a landscape can be used to infer how the landscape changes over time.
- D. Some rocks are harder than others to erode and so last a longer time.

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.2*

*Topic: Investigating Geologic Questions*

19. Which of the following is a principle to interpret relative ages?

- A. The youngest rock is on the bottom.
- B. A geologic feature is older than any rock or feature it crosscuts.
- C. A younger rock can include pieces of an older rock.
- D. An older magma can bake or metamorphose younger rocks.

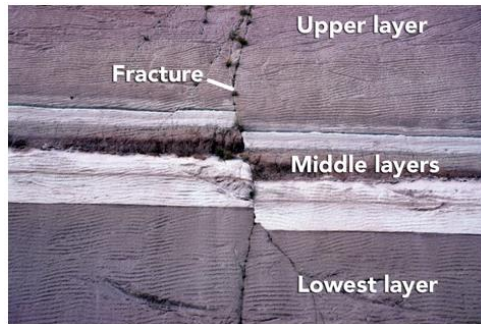
*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.2*

*Topic: Investigating Geologic Questions*

20. What order did the rock layers and features form in this photograph (listed from oldest to youngest)?



- A. upper layer, fracture, middle layers, lowest layer
- B. lowest layer, middle layers, fracture, upper layer
- C. lower layer, middle layers, upper layer, fracture
- D. none of these

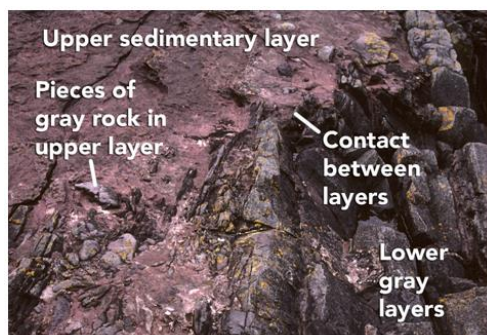
*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.2*

*Topic: Investigating Geologic Questions*

21. What can you interpret about the relative age of the rocks and features in this photograph?



- A. The upper sedimentary layer is younger.
- B. The lower gray layers are younger.
- C. The layers are the same age because the boundary is so irregular.
- D. It is not possible to tell the relative ages of the layers.

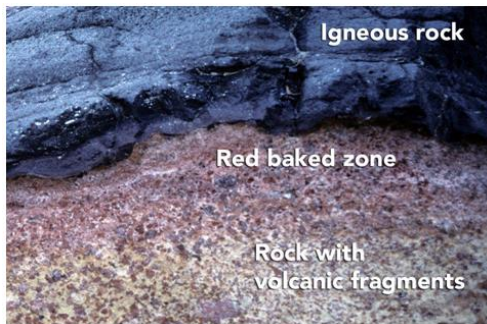
*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.2*

*Topic: Investigating Geologic Questions*

22. What is the best criterion for the relative ages of the rocks in this photograph?



- A. The igneous rock is younger because it is on top.
- B.** The igneous rock is younger because it has baked the adjacent rock.
- C. The lower rock is younger because it contains pieces of volcanic rock.
- D. The igneous rock is older because it formed at depth.

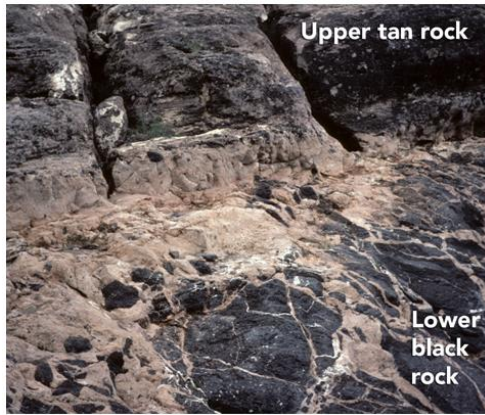
*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.2*

*Topic: Investigating Geologic Questions*

23. Which of the following are valid criteria for inferring the relative ages of the two rock types in this photograph?



- A. The black rock is younger because it is on the bottom.
- B. The tan rock is younger because it contains pieces of the black rock.**
- C. The black rock is younger because it is crosscut by the tan rock.
- D. The evidence is contradictory about the relative ages of these two rocks.

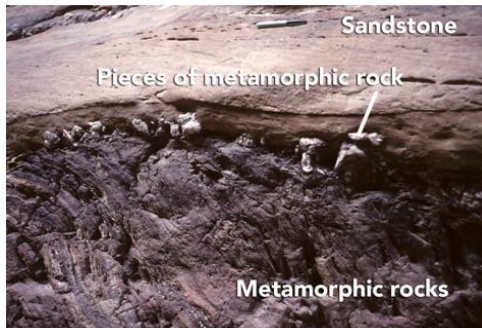
*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.2*

*Topic: Investigating Geologic Questions*

24. What can you interpret about the relative ages of the rocks and features in this photograph?



- A. The sandstone is older because it is lighter in color.
- B. The metamorphic rock is older because it is rougher from longer weathering.
- C. The metamorphic rock is older because pieces of it are in the sandstone.
- D. The sandstone is older because it is on top.

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.2*

*Topic: Investigating Geologic Questions*

25. What type of map is shown here?



- A. shaded-relief map
- B. topographic map with contours
- C. satellite image
- D. geologic map

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.3*

*Section: 2.4*

*Topic: Nature of Geology*



26. What type of map is shown here?



- A. shaded-relief map
- B. topographic map with contours**
- C. satellite image
- D. geologic map

*Difficulty Level: Remember*  
*Difficulty Level: Understand*  
*Section: 2.3*  
*Section: 2.4*  
*Topic: Nature of Geology*

27. Which of the following map or diagram would best show you the shape of the land surface?

- A. shaded-relief map**
- B. satellite image
- C. geologic map
- D. stratigraphic section

*Difficulty Level: Analyze*  
*Difficulty Level: Apply*  
*Section: 2.3*  
*Section: 2.4*  
*Topic: Investigating Geologic Questions*

28. Which type of map or diagram would best indicate elevation of the land surface?

- A. shaded-relief map
- B. satellite image
- C. topographic map**
- D. stratigraphic section

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.3*

*Section: 2.4*

*Topic: Investigating Geologic Questions*

29. What type of figure would you use to portray the relative thicknesses of rock units stacked on top of one another?

- A. shaded relief map
- B. topographic map
- C. satellite image
- D. stratigraphic section**
- E. evolutionary diagram

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.3*

*Section: 2.4*

*Topic: Investigating Geologic Questions*

30. What does the type of evolutionary diagrams discussed in the textbook show?

- A. how one creature evolved into another creature
- B. changing of fossils up through a stratigraphic section
- C. evolution of the ways topographic maps have been drawn during history
- D. the sequence of events that deposited the rocks and formed the landscape**

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.3*

*Section: 2.4*

*Topic: Investigating Geologic Questions*

31. If you wanted to determine how deep a rock layer was below a particular point on the surface, what type of figure would be most useful?

- A. shaded relief map
- B. topographic map
- C. satellite image
- D. evolutionary diagram
- E. geologic cross section**

*Difficulty Level: Remember*

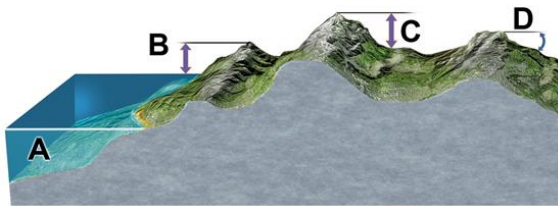
*Difficulty Level: Understand*

*Section: 2.3*

*Section: 2.4*

*Topic: Investigating Geologic Questions*

32. Which letter on the accompanying figure indicates the elevation?



- A. A
- B. B**
- C. C
- D. D

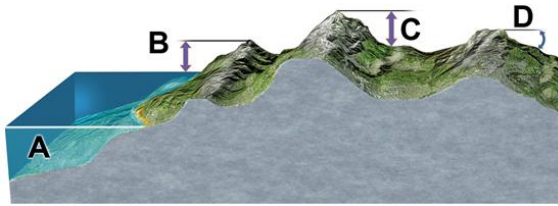
*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.4*

*Topic: Investigating Geologic Questions*

33. Which letter on the accompanying figure indicates the amount of topographic relief?



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

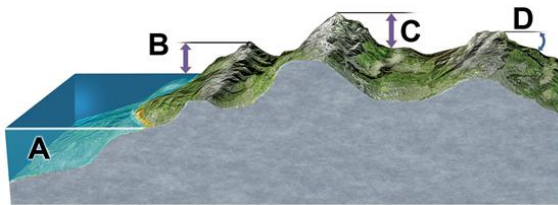
*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.4*

*Topic: Investigating Geologic Questions*

34. Which letter on the accompanying figure indicates depth?



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

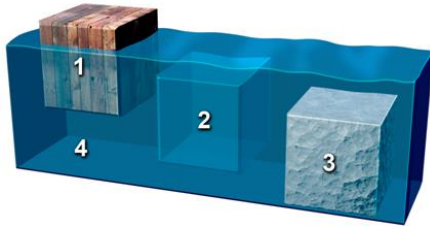
*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.4*

*Topic: Investigating Geologic Questions*

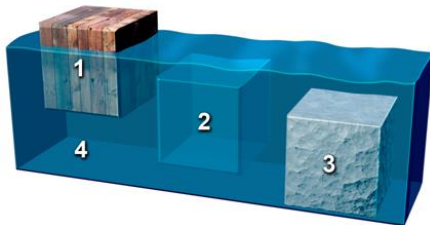
35. This figure shows three blocks in water. Which of these materials is the densest?



- A. block 1
- B. block 2
- C. block 3
- D. the water

*Difficulty Level: Remember*  
*Difficulty Level: Understand*  
*Section: 2.5*  
*Topic: Nature of Geology*

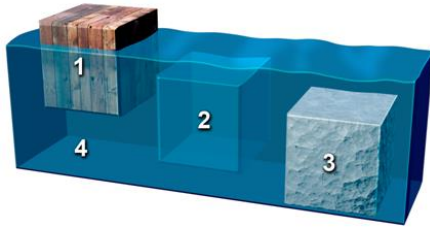
36. This figure shows three blocks in water. Which of these materials is the least dense?



- A. block 1
- B. block 2
- C. block 3
- D. the water 4

*Difficulty Level: Remember*  
*Difficulty Level: Understand*  
*Section: 2.5*  
*Topic: Nature of Geology*

37. This figure shows three blocks in water. Which two materials have the same density?



- A. blocks 1 and 2
- B. blocks 2 and 3
- C. block 1 and 3
- D. block 2 and the water 4**
- E. block 3 and the water 4

*Difficulty Level: Remember*  
*Difficulty Level: Understand*  
*Section: 2.5*  
*Topic: Nature of Geology*

38. Which of the following is an example of quantitative data?

- A. Augustine volcano represents a dangerous situation
- B. the rocks were dark gray and angular
- C. the steam coming from the mountain was dark gray in color
- D. the rocks were too hot to touch
- E. none of these**

*Difficulty Level: Analyze*  
*Difficulty Level: Apply*  
*Section: 2.5*  
*Topic: Investigating Geologic Questions*

39. Which of the following is an example of quantitative data?

- A.** North America is moving across Earth's surface several centimeters per year
- B. the river has flooded a low-lying area
- C. the volcano is releasing much steam
- D. volcanoes are dangerous
- E. when held, one rock feels heavier than another rock

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.5*

*Topic: Investigating Geologic Questions*

40. Which of the following is true about density and weight?

- A. density is higher if you have a larger volume of the same material
- B. density is lower if you have a larger volume of the same material
- C. a substance is more dense at night than during the day
- D.** weight depends on the mass of the object and the pull of gravity
- E. none of these

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.5*

*Topic: Investigating Geologic Questions*

41. If a runner races 50 meters in 5 seconds, how fast is she going?

- A. 1 meter per second
- B. 5 meters per second
- C.** 10 meters per second
- D. 50 meters per second
- E. none of these

*Difficulty Level: Analyze*

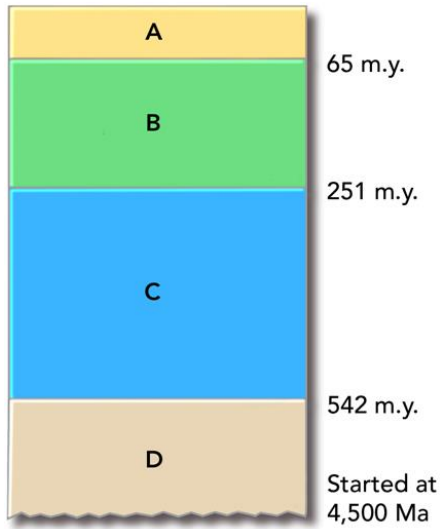
*Difficulty Level: Apply*

*Section: 2.6*

*Topic: Investigating Geologic Questions*



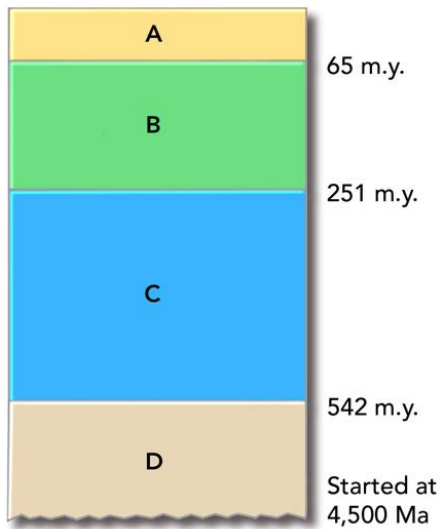
42. This figure shows the main subdivisions of the geologic timescale. Which of these is the Cenozoic?



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

*Difficulty Level: Remember*  
*Difficulty Level: Understand*  
*Section: 2.6*  
*Topic: Nature of Geology*

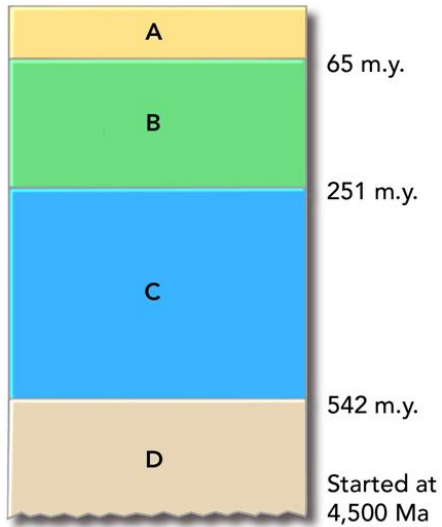
43. This figure shows the main subdivisions of the geologic timescale. Which of these is the Mesozoic?



- A. A
- B. B**
- C. C
- D. D

*Difficulty Level: Remember*  
*Difficulty Level: Understand*  
*Section: 2.6*  
*Topic: Nature of Geology*

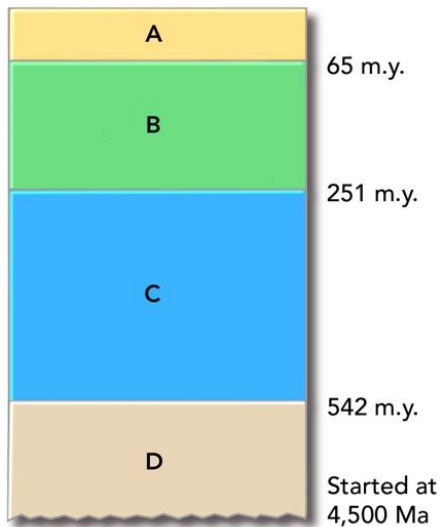
44. This figure shows the main subdivisions of the geologic timescale. Which of these is the Paleozoic?



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

*Difficulty Level: Remember*  
*Difficulty Level: Understand*  
*Section: 2.6*  
*Topic: Nature of Geology*

45. This figure shows the main subdivisions of the geologic timescale. Which of these is the Precambrian?



- A. A
- B. B
- C. C
- D. D**

*Difficulty Level: Remember*  
*Difficulty Level: Understand*  
*Section: 2.6*  
*Topic: Nature of Geology*

46. Which of the following correctly lists the four main chapters of Earth's history, from oldest to youngest?

- A. Paleozoic, Mesozoic, Cenozoic, Precambrian
- B. Cenozoic, Mesozoic, Paleozoic, Precambrian
- C. Paleozoic, Precambrian, Mesozoic, Cenozoic
- D. Precambrian, Cenozoic, Mesozoic, Paleozoic
- E. Precambrian, Paleozoic, Mesozoic, Cenozoic**

*Difficulty Level: Remember*  
*Difficulty Level: Understand*  
*Section: 2.6*  
*Topic: Investigating Geologic Questions*

Chapter 02 - Investigating Geologic Questions

47. Which of the following represents the longest duration of geologic time?

- A. Jurassic
- B.** Precambrian
- C. Paleozoic
- D. Mesozoic
- E. Cenozoic

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.6*

*Topic: Investigating Geologic Questions*

48. Which of the following parts of geologic time is the shortest?

- A. Precambrian
- B. Paleozoic
- C. Mesozoic
- D.** Cenozoic

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.6*

*Topic: Investigating Geologic Questions*

49. If all of geologic time is represented as a single year, and the Jurassic Period is in the middle of the Mesozoic era, what month were dinosaurs most abundant on the planet?

- A. January
- B. April
- C. June
- D. July
- E.** December

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.6*

*Topic: Investigating Geologic Questions*

50. Which of the following is data rather than an interpretation?

- A. Recent volcanism at Yellowstone is related to the process that caused the low topography.
- B.** There is an area of low topography southwest of Yellowstone National Park.
- C. Volcanism in Yellowstone overlies an area of hotter-than-average mantle.
- D. The low topography southwest of Yellowstone formed when North America moved over a hot spot.

*Difficulty Level: Create*

*Difficulty Level: Evaluate*

*Section: 2.7*

*Topic: Investigating Geologic Questions*

51. Which of the following is data rather than an interpretation?

- A. Some trees along Yellowstone Lake were flooded when the land north of the lake rose because of magma at depth.
- B. Rising and sinking of the land around Yellowstone is related to underlying magma.
- C. The ages of volcanic centers near Yellowstone indicate that North America is moving southwest over the mantle.
- D. All of these are data rather than interpretations.
- E.** All of these are interpretations rather than data.

*Difficulty Level: Create*

*Difficulty Level: Evaluate*

*Section: 2.7*

*Topic: Investigating Geologic Questions*

52. A key step in developing a new explanation is:

- A. making observations about a place or process
- B. asking questions about the observations
- C. proposing an interpretation that can be tested
- D. collecting new observations to test predictions
- E.** all of these

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.8*

*Topic: Investigating Geologic Questions*

53. What steps are involved in having a hypothesis become an established theory?
- A. A United Nations scientific panel votes on whether the hypothesis is accepted.
  - B. A U.S. government agency votes on whether the hypothesis is accepted.
  - C. The hypothesis is consistent with new data and investigations used to test its predictions.
  - D. The hypothesis makes sense when explained by politicians.

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.8*

*Topic: Investigating Geologic Questions*

54. Which of the following is NOT a problem addressed by geologists?
- A. energy and mineral resources
  - B. volcanoes and other natural hazards
  - C. geometry of rock layers in the subsurface
  - D. flow of groundwater
  - E. all of these are addressed by geologists

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.9*

*Topic: Investigating Geologic Questions*

55. What is probably the most important factor in the health of most ecosystems?
- A. the amount of calcium in the soil
  - B. the amount of potassium in the soil
  - C. availability of clean water
  - D. the length of daylight hours
  - E. how often hurricanes strike

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.9*

*Topic: Investigating Geologic Questions*



56. Which of the following was NOT a possible explanation for the origin of the crater in Arizona?

- A. meteoroid impact
- B. volcanic explosion
- C. warping by a rising mass of salt
- D.** collapse of large crystal-filled cave

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.10*

*Topic: Investigating Geologic Questions*

57. Which of the following would be most consistent with a volcanic origin for the Arizona crater discussed in the textbook?

- A. a mass of salt should exist beneath the crater
- B. meteorite fragments would be scattered across the area
- C.** solidified magma might underlie the crater floor
- D. there will be no volcanic rocks because of the explosion

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.10*

*Topic: Investigating Geologic Questions*

58. What explanation did the textbook favor for the origin of the crater in Arizona?

- A. an explosion when rising magma encountered groundwater
- B. warping by a rising mass of salt that was later dissolved away to form the crater
- C. collapse of a large cave that contained large crystals of gypsum
- D.** impact by a large meteoroid that hit the surface at a very high speed

*Difficulty Level: Remember*

*Difficulty Level: Understand*

*Section: 2.10*

*Topic: Investigating Geologic Questions*

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59. Which of the following would be most consistent with an origin of Upheaval Dome by a meteoroid impact?

- A. a mass of salt should exist beneath the crater
- B. solidified magma might underlie the crater floor
- C. presence of volcanic layers much older than the crater
- D. presence of volcanic fragments scattered around the crater
- E.** none of these

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.11*

*Topic: Investigating Geologic Questions*

60. Which of the following would be consistent with an origin of Upheaval Dome by a rising salt mass?

- A. the presence of a thick salt layer beneath the region
- B. structures that are similar to those formed around rising salt
- C. a lower density for salt than typical rocks
- D.** all of these
- E. none of these

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.11*

*Topic: Investigating Geologic Questions*

61. Which of the following would be most consistent with an origin of Upheaval Dome by rising magma?

- A. an igneous body should exist beneath the crater
- B. baking of the layers closest to the magma
- C. an age determination on igneous rocks that is younger than the age of the rock layers
- D.** all of these

*Difficulty Level: Analyze*

*Difficulty Level: Apply*

*Section: 2.11*

*Topic: Investigating Geologic Questions*