

**Earth Science, 14e (Tarbuck/Lutgens)**

**Chapter 3 Rocks: Materials of the Solid Earth**

1) Why does magma rise toward the Earth's surface?

- A) because it is hot
- B) because it is a liquid
- C) because it is less dense than the material around it
- D) because it is immiscible and cannot combine with the material around it

Answer: C

Diff: 1

Topic: 3.1 Earth as a System: The Rock Cycle

Bloom's Taxonomy: Knowledge/Comprehension

2) What is required for an igneous rock to *weather*?

- A) It must move downslope under the influence of gravity.
- B) It must be exposed at the surface of the Earth.
- C) It must be uplifted from where it was emplaced.
- D) It must be deposited by water or ice.

Answer: B

Diff: 1

Topic: 3.1 Earth as a System: The Rock Cycle

Bloom's Taxonomy: Knowledge/Comprehension

3) What is the most common place for sediment to be deposited?

- A) rivers
- B) beaches
- C) mountains
- D) oceans

Answer: D

Diff: 1

Topic: 3.1 Earth as a System: The Rock Cycle

Bloom's Taxonomy: Knowledge/Comprehension

4) What is the difference between "magma" and "lava"?

- A) Magma is formed deep in the Earth and lava forms near the surface of the Earth.
- B) It is just a name change, and lava is what magma is called if it reaches the surface of the Earth.
- C) Magma makes igneous rocks and lava forms volcanoes.
- D) Magma is less dense than lava.

Answer: B

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

5) Which of the following places is well known for its intrusive igneous rocks that were exposed by erosion?

- A) Mount St. Helens Volcano
- B) Hawaii
- C) Yosemite National Park
- D) Yellowstone National Park

Answer: C

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

6) Why do crystals in a magma stop growing during cooling?

- A) They run out of space.
- B) They run out of heat.
- C) They become too dense to grow.
- D) The pressure from rocks above becomes too great and the magma stops growing crystals.

Answer: A

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

7) If magma or lava cools quickly, the resulting igneous rock will have \_\_\_\_\_.

- A) more silicate minerals
- B) more variations in mineral types
- C) very small crystals
- D) very large crystals

Answer: C

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

8) Which of the following is **not** a dark silicate mineral?

- A) biotite
- B) amphibole
- C) quartz
- D) pyroxene

Answer: C

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

9) Igneous rocks with an andesitic composition \_\_\_\_\_.

- A) are denser than basaltic compositional rocks
- B) make up most of the sea floor
- C) are denser than granitic compositional rocks
- D) are found primarily in continental interiors

Answer: C

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

10) Which of the following is **not** true of peridotite?

- A) It is rarely found at the Earth's surface.
- B) It is denser than basaltic rocks.
- C) It is composed almost entirely of olivine and pyroxene.
- D) It is the main constituent of the Earth's crust.

Answer: D

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

11) Rocks that contain high amounts of silica typically also contain \_\_\_\_\_.

- A) iron, magnesium, potassium
- B) aluminum, magnesium, and potassium
- C) aluminum, sodium, and potassium
- D) calcium, magnesium, and potassium

Answer: C

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

12) Intrusive igneous rocks are often characterized as coarse-grained because \_\_\_\_\_.

- A) the pressures at depth cause them to have a rough texture
- B) the slow cooling at depth allows large crystals to grow
- C) the uplift process that exposes the rock fractures them and makes them rough
- D) small holes from escaping gases leave them rough and coarse

Answer: B

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

13) A porphyritic texture where large crystals are embedded in a matrix of small crystal may form when \_\_\_\_\_.

- A) climate change causes crystals to cool at different rates
- B) crystals of different compositions cool at different rates
- C) crystals of different compositions grow to different sizes
- D) a magma that has partially crystallized slowly moves to a different location where it then cools rapidly.

Answer: D

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

14) Obsidian exhibits a \_\_\_\_\_ texture.

- A) fine-grained
- B) glassy
- C) coarse-grained
- D) porphyritic

Answer: B

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

15) Which igneous texture is characterized by two distinctively different crystal sizes?

- A) fine-grained
- B) glassy
- C) coarse-grained
- D) porphyritic

Answer: D

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

16) Granite and gabbro \_\_\_\_\_.

- A) have a similar mineral composition
- B) have a similar texture
- C) are similar in both texture and mineral composition
- D) are not similar in either texture or mineral composition

Answer: B

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Application/Analysis

17) Rhyolite is the fine-grained equivalent of this igneous rock.

- A) basalt
- B) andesite
- C) granite
- D) diorite

Answer: C

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

18) Which one of the following is an igneous rock?

- A) limestone
- B) rhyolite
- C) slate
- D) shale

Answer: B

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

19) Select from the list below the coarse-grained rock which is composed mainly of quartz and potassium feldspar.

- A) basalt
- B) andesite
- C) granite
- D) diorite

Answer: C

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

20) The texture of an igneous rock \_\_\_\_\_.

- A) is controlled by the composition of magma
- B) determines the color of the rock
- C) is caused by leaching
- D) records the rock's cooling history

Answer: D

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

21) Igneous rock is formed \_\_\_\_\_.

- A) by the weathering of preexisting rocks
- B) by changes in mineral composition
- C) at great depth within Earth
- D) by crystallization of magma

Answer: D

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

22) The first step in turning a rock into a sediment is \_\_\_\_\_.

- A) gravity and erosional agents (wind, water, etc.) remove material from the parent rock
- B) rock is broken into small pieces during the transportation phase
- C) weathering alters the rock
- D) compaction

Answer: C

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

23) Most sediment is formed by \_\_\_\_\_.

- A) settling out of a fluid
- B) the downhill movement of material during mass wasting
- C) the rapid distribution of material in a mountain stream
- D) rocks that erode from the bottoms of glaciers

Answer: A

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

24) Which of the following is an economically important sedimentary rock?

- A) marble
- B) coal
- C) pumice
- D) calcite

Answer: B

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

25) Which of the following pairs are likely products of weathering granite?

- A) sandstone and calcite
- B) feldspar and mica
- C) clay and quartz
- D) olivine and pyroxene

Answer: C

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

26) Which of the following is **not** a product of the chemical weathering of potassium feldspar?

- A) silica
- B) potassium ions
- C) iron oxide
- D) clay

Answer: C

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

27) Detrital sedimentary rocks are typically classified on the basis of their \_\_\_\_\_.

- A) lithology
- B) texture
- C) provenance
- D) particle size

Answer: D

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

28) Breccia, a rock with angular particles, is likely to have traveled \_\_\_\_\_.

- A) in a mountain stream
- B) only a short distance
- C) a long distance
- D) in a glacier

Answer: B

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

29) When sand lithifies, the resulting rock is commonly called \_\_\_\_\_.

- A) sandstone
- B) shale
- C) conglomerate
- D) breccia

Answer: A

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

30) The most common sedimentary rock is \_\_\_\_\_.

- A) sandstone
- B) shale
- C) conglomerate
- D) breccia

Answer: B

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

31) Silts and clays are commonly deposited in lakes, lagoons, swamps and marine environments because \_\_\_\_\_.

- A) those settings are more acidic
- B) those settings are more basic
- C) those settings have relatively still water
- D) those settings have highly varied activities and multiple inlets for water

Answer: C

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

32) Chemical sedimentary rocks form from materials \_\_\_\_\_.

- A) carried in solution
- B) too fine to see without a microscope
- C) that form weak bonds with oxygen
- D) all of the above

Answer: A

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension



33) Limestone is formed primarily through \_\_\_\_\_.

- A) direct precipitation from seawater
- B) chemical interactions between ocean bottom sediments and ions in sea water
- C) biochemical sediments secreted by marine organisms
- D) evaporation of calcite rich seawater

Answer: C

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

34) Chalk forms from \_\_\_\_\_.

- A) the hard parts of microscopic organisms that accumulate on the sea floor
- B) magnesium rich fluids that chemically alter limestone bearing reefs
- C) direct precipitation from seawater
- D) evaporation of magnesium rich waters

Answer: A

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

35) Which one of the following is **not** related to chemical weathering?

- A) decomposition
- B) frost wedging
- C) hydrolysis
- D) oxidation

Answer: B

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

36) Chemical weathering would be most effective \_\_\_\_\_.

- A) in a warm, dry climate
- B) in a cold, dry climate
- C) in a warm, humid climate
- D) equally in any kind of climate

Answer: C

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

37) Travertine, a form of limestone commonly found in caves, forms \_\_\_\_\_.

- A) when water in a cave is heated
- B) when water in a cave is cooled
- C) when carbon dioxide in the water escapes into the air
- D) when carbon dioxide from the air contacts the moisture in the cave

Answer: C

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

38) Death Valley is a site where \_\_\_\_\_ sedimentary rocks are common.

- A) detrital
- B) evaporite
- C) biochemical
- D) clastic

Answer: B

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

39) An important condition for the formation of coal is \_\_\_\_\_.

- A) abundant plant and animal life in a region
- B) decomposition of organic matter with abundant oxygen
- C) incomplete decomposition of organic matter due to a lack of oxygen
- D) acid rich waters that reduce the organic matter to pure carbon

Answer: C

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

40) Sedimentary rocks comprise approximately \_\_\_\_\_ percent of Earth's outermost 10 miles.

- A) 5
- B) 15
- C) 30
- D) 50

Answer: A

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

41) Which rock type is associated with a high-energy environment (such as a very turbulent stream)?

- A) conglomerate
- B) shale
- C) chert
- D) none of these

Answer: A

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

42) Detrital sediments would predominate in all of the following environments except \_\_\_\_\_.

- A) swamp
- B) salt flat
- C) river floodplain
- D) delta

Answer: B

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

43) Compaction would probably be most significant as a lithification process for \_\_\_\_\_.

- A) shale
- B) sandstone
- C) conglomerate
- D) breccia

Answer: A

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

44) The most abundant chemical sedimentary rock is \_\_\_\_\_.

- A) limestone
- B) dolomite
- C) chert
- D) rock salt

Answer: A

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

45) Which of the following best describes bedded gypsum and rock salt?

- A) detrital sedimentary rocks
- B) varieties of dolostone
- C) varieties of coal and peat
- D) evaporates; chemical, sedimentary rocks

Answer: D

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

46) Coal beds originate in \_\_\_\_\_.

- A) shallow lakes in a dry, desert region
- B) channels of fast-moving streams
- C) deep, marine basins below wave action
- D) freshwater coastal swamps and bogs

Answer: D

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

47) The common source of pressure during compaction of sediments is \_\_\_\_\_.

- A) the weight of the sediments deposited above the compacting sediments
- B) the pressure of the sediments pushing the compacting sediments out of the way during deposition
- C) the weight of the compacting sediments causing internal pressure
- D) the weight of water above the sediments after they are deposited

Answer: A

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

48) For a geologist, the most important characteristic of a sedimentary rock is its \_\_\_\_\_.

- A) texture
- B) composition
- C) layering
- D) lithology

Answer: C

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

- 49) Metamorphism occurs when a rock \_\_\_\_\_.
- A) experiences conditions that include high temperatures
  - B) experiences conditions that include high pressures
  - C) experiences conditions that are significantly different from those that formed the rock
  - D) experiences conditions that are similar to those that formed the rock

Answer: C

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

- 50) The low grade metamorphism of shale produces \_\_\_\_\_.

- A) marble
- B) schist
- C) gneiss
- D) slate

Answer: D

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

- 51) Mountain building causes metamorphism because \_\_\_\_\_.

- A) mountains are heavy and they compress the rocks under them.
- B) mountains are heavy and they push shallow, cool rocks to depths where they get heated
- C) mountains form by the gradual buildup of material that comes from other areas and this can produce an uneven pressure on rocks
- D) all of the above

Answer: D

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Application/Analysis

- 52) The most important agent(s) of metamorphism, according to your text, is (are) \_\_\_\_\_.

- A) chemically active fluids
- B) heat
- C) differential stress
- D) confining pressure

Answer: B

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

- 53) The major role of thermal energy (heat) in metamorphism is \_\_\_\_\_.
- A) reducing the strength of rocks so that stress can be an effective agent of change
  - B) increasing the processes of dissolution and flow of different minerals
  - C) driving chemical reactions that lead to recrystallization
  - D) providing energy for the physical changes that occur during metamorphism

Answer: C

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

- 54) In an area where the temperature increase with depth averages 20°C per kilometer, the temperature at a depth of 5 kilometers would be \_\_\_\_\_.

- A) 100°C
- B) 200°C
- C) 50°C
- D) 20°C

Answer: A

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

- 55) The quartz in granite begins to melt at 650°C, so if we find a migmatite where quartz has melted in a granitic rock and we know the temperature in the region increased with depth by about 25°C per kilometer, we could estimate the depth that the rock had been at to be about \_\_\_\_\_.

- A) 12.5 km
- B) 18.0 km
- C) 23.5 km
- D) 26.0 km

Answer: D

Diff: 2

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

- 56) Confining pressure is where \_\_\_\_\_.

- A) forces are applied equally in all directions
- B) forces are applied from the top and the bottom equally
- C) pressure is applied in a cubic region
- D) pressure is parallel to the bedding planes

Answer: A

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

57) When rocks experience high temperatures and differential stresses deep in the Earth, their grains tend to \_\_\_\_\_.

- A) break in small fragments like a piece of fine crystal
- B) fracture along planes of weakness
- C) flatten and elongate
- D) form new minerals

Answer: C

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

58) Chemically active fluids are \_\_\_\_\_.

- A) fluids that readily change to gases at surface conditions
- B) fluids that contain large quantities of oxygen which reacts with most minerals to form new minerals during metamorphism
- C) more acidic than regular fluids
- D) more basic than regular fluids

Answer: A

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

59) Recrystallization during metamorphism causes grains to grow longer in the \_\_\_\_\_.

- A) direction of maximum differential stress
- B) direction perpendicular to the compressional stress
- C) direction parallel to the compressional stress
- D) horizontal direction

Answer: B

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

60) Slate is \_\_\_\_\_ than shale.

- A) more planar
- B) darker
- C) denser
- D) lighter

Answer: C

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

61) Which of the following is **not** an example of a foliation in a metamorphic rock?

- A) compositional banding
- B) bedding planes and strata
- C) parallel alignment of flattened pebbles
- D) parallel alignment of platy or flat minerals

Answer: B

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

62) Which of the following changes may occur during metamorphism?

- A) Certain minerals may recrystallize.
- B) The rock becomes more compact.
- C) Crystals may grow larger.
- D) all of the above

Answer: D

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Application/Analysis

63) The common rock produced by the metamorphism of limestone is \_\_\_\_\_.

- A) marble
- B) mica schist
- C) phyllite
- D) gneiss

Answer: A

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

64) \_\_\_\_\_ is composed of alternating bands of light and dark silicate minerals.

- A) Marble
- B) Mica schist
- C) Phyllite
- D) Gneiss

Answer: D

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension



65) The primary agent of contact metamorphism is \_\_\_\_\_.

- A) folding
- B) heat
- C) stress
- D) strain

Answer: B

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

66) Which of the following lists the rocks in the order of increasing grain size and increasing grade of metamorphism?

- A) phyllite, slate, schist
- B) schist, slate, phyllite
- C) slate, phyllite, schist
- D) slate, schist, phyllite

Answer: C

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Application/Analysis

67) Magma differentiation tends to produce deposits of \_\_\_\_\_ near the base of intrusions.

- A) gold
- B) silver
- C) chromite
- D) copper

Answer: C

Diff: 1

Topic: 3.5 Resources from Rocks and Minerals

Bloom's Taxonomy: Knowledge/Comprehension

68) The very large crystals of quartz, feldspar, and muscovite found in pegmatites form from \_\_\_\_\_.

- A) the early crystallizing parts of a magma
- B) the final crystallizing parts of a magma
- C) the middle crystallizing parts of a magma
- D) all of the above

Answer: B

Diff: 1

Topic: 3.5 Resources from Rocks and Minerals

Bloom's Taxonomy: Knowledge/Comprehension

69) The minerals gold, silver and mercury are often found in \_\_\_\_\_.

- A) hydrothermal veins
- B) the lower parts of an intrusion
- C) disseminated deposits
- D) alteration of limestone

Answer: A

Diff: 1

Topic: 3.5 Resources from Rocks and Minerals

Bloom's Taxonomy: Knowledge/Comprehension

70) A major difference between coal and oil/gas is \_\_\_\_\_.

- A) coal forms in deep marine environments and oil/gas form in shallow marine environments
- B) coal forms in shallow marine environments and oil/gas form in swamps
- C) coal forms in swamps and oil/gas form in marine environments
- D) coal forms on land from dinosaurs and oil/gas form from ancient fish

Answer: C

Diff: 1

Topic: 3.5 Resources from Rocks and Minerals

Bloom's Taxonomy: Knowledge/Comprehension

71) In order to get oil and gas in sufficient quantities to make a profit, an oil trap must exist with \_\_\_\_\_.

- A) no fractures or structure
- B) permeability and porosity
- C) lateral continuity that allows fluids to migrate
- D) shale with little or no sulfur.

Answer: B

Diff: 1

Topic: 3.5 Resources from Rocks and Minerals

Bloom's Taxonomy: Knowledge/Comprehension

**Word Analysis.** Examine the words and/or phrases for each question below and determine the relationship among the majority of words/phrases. Choose the option which does not fit the pattern.

72) lava      magma      pahoehoe      aa

Answer: magma

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

73) pyroxene      plagioclase      quartz      olivine

Answer: quartz

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

74) granite      basalt      diorite      gabbro

Answer: basalt

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Application/Analysis

75) calcite      iron oxide      shale      silica

Answer: shale

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

76) lithification      cementation      weathering      compaction

Answer: weathering

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Application/Analysis

77) shale      sandstone      breccia      conglomerate

Answer: shale

Diff: 2

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Application/Analysis

78) confining pressure      differential stress      melting      chemical fluids

Answer: melting

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Application/Analysis

79) Under the right circumstances, any rock can be transformed into another type of rock in the rock cycle.

Answer: TRUE

Diff: 1

Topic: 3.1 Earth as a System: The Rock Cycle

Bloom's Taxonomy: Knowledge/Comprehension

80) The change from a sediment to a sedimentary rock typically involves burying the sediment.

Answer: TRUE

Diff: 1

Topic: 3.1 Earth as a System: The Rock Cycle

Bloom's Taxonomy: Knowledge/Comprehension

81) Magma is currently forming beneath the Rockies.

Answer: FALSE

Diff: 1

Topic: 3.1 Earth as a System: The Rock Cycle

Bloom's Taxonomy: Knowledge/Comprehension

82) Lava always erupts violently, but magma often flows quietly.

Answer: FALSE

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

83) Crystal size is controlled by temperature.

Answer: FALSE

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

84) Igneous rocks are composed primarily of sulfate-type minerals.

Answer: FALSE

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

85) Basaltic rocks make up most of the sea floor.

Answer: TRUE

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

86) Bowen's reaction series predicts the sizes of the different mineral grains that grow from crystallizing magmas.

Answer: FALSE

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

87) Olivine and quartz are commonly found together in the same igneous rock.

Answer: FALSE

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

88) One magma can produce several different igneous rocks having different mineral compositions.

Answer: TRUE

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

89) Basalt is the fine-grained equivalent of gabbro.

Answer: TRUE

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

90) Glassy igneous rocks form when magma cools too fast for mineral grains to grow.

Answer: TRUE

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

91) Quartz is quite resistant to weathering and is an important component of sands in riverbeds and on beaches.

Answer: TRUE

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

92) Sedimentary rocks make up approximately 60 percent of the rocks in the Earth's crust.

Answer: FALSE

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

93) Sedimentary rocks are an important source of information about the Earth's history.

Answer: TRUE

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

94) Lignite and bituminous coals are sedimentary rocks.

Answer: TRUE

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

95) The particles in breccia are primarily silt sized.

Answer: FALSE

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

96) The most abundant sedimentary rock is shale.

Answer: TRUE

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

97) Evaporites have a biochemical origin.

Answer: FALSE

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

98) Particle size is the primary basis for distinguishing among various detrital sedimentary rocks.

Answer: TRUE

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

99) Most limestone has a biochemical origin.

Answer: TRUE

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

100) Compaction is most significant as a lithification process for sedimentary rocks composed of sand-sized particles.

Answer: FALSE

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

101) Every metamorphic rock has a parent rock from which it formed.

Answer: TRUE

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

102) During metamorphism, the material undergoing deformation remains a solid.

Answer: TRUE

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

103) In general, recrystallization tends to produce larger crystals.

Answer: TRUE

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

104) Slate is associated with high-grade metamorphism.

Answer: FALSE

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

105) Metamorphism can affect only sedimentary rocks.

Answer: FALSE

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

106) Most of the energy and mineral resources we use are renewable.

Answer: FALSE

Diff: 1

Topic: 3.5 Resources from Rocks and Minerals

Bloom's Taxonomy: Knowledge/Comprehension

107) An igneous rock that cools deep inside the Earth is called a(n) \_\_\_\_\_ igneous rock

Answer: intrusive

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

108) Igneous rocks that contain mostly quartz and feldspar with small amounts of biotite would be described as having a(n) \_\_\_\_\_ composition.

Answer: granitic

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

109) Igneous rocks are classified on the basis of what two main characteristics?

Answer: texture and mineral composition

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

110) Obsidian exhibits a(n) \_\_\_\_\_ texture.

Answer: glassy

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Knowledge/Comprehension

111) If all of the olivine crystallized in a typical magma and then settled to the floor of the magma chamber, would there still be enough elements present in the magma to form quartz?

Answer: Yes, there is much more silicon and oxygen present in a typical magma than iron and magnesium.

Diff: 2

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Application/Analysis

112) Rock salt and rock gypsum are common examples of a group of chemical sedimentary rocks called \_\_\_\_\_.

Answer: evaporites

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

113) Probably the single most characteristic feature of sedimentary rocks is \_\_\_\_\_.

Answer: layering (strata or beds)

Diff: 1

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Knowledge/Comprehension

114) List three agents of metamorphism.

Answer: heat, pressure, chemically active fluids

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension

115) When a metamorphic rock exhibits a layered or banded appearance, it is said to exhibit a(n) \_\_\_\_\_ texture.

Answer: foliated

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Knowledge/Comprehension



**Critical Thinking and Discussion.** Use complete sentences, correct spelling, and the information presented in Chapter 3 to answer the questions below.

116) Why do most sediments end up being deposited in oceans instead of other parts of the Earth?






Answer: There are a few explanations. First, 2/3 of the Earth's surface is oceans so it is most likely that anything on the Earth's surface will be in an ocean. In addition, most streams end in the oceans and the streams are one of the important mechanisms for moving sediment. I would also add that gravity moves things downhill and the ocean basins are generally lower than the continental surfaces.

Diff: 1

Topic: 3.1 Earth as a System: The Rock Cycle

Bloom's Taxonomy: Application/Analysis

117) Fill in the missing rock names on the chart below.

Chemical Composition		Granitic (Felsic)	Andesitic (Intermediate)	Basaltic (Mafic)	Ultramafic
Dominant Minerals		Quartz Potassium feldspar Sodium-rich plagioclase feldspar	Amphibole Sodium- and calcium-rich plagioclase feldspar	Pyroxene Calcium-rich plagioclase feldspar	Olivine Pyroxene
TEXTURE	Coarse-grained	 Granite			
	Fine-grained		Andesite	Basalt	Komatiite (rare)
	Porphyritic	"Porphyritic" precedes any of the above names whenever there are appreciable phenocrysts			Uncommon
	Glassy	Obsidian (compact glass) Pumice (frothy glass)			
Rock Color (based on % of dark minerals)		0% to 25%	25% to 45%	45% to 85%	85% to 100%

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Answer: See Figure 3.7 in *Earth Science*, 14e.

Diff: 1

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Application/Analysis

118) What does Bowen's reaction series tell us about how rocks evolve?

Answer: Bowen's reaction series gives the temperature and order in which minerals crystallize from a magma (or alternatively melting temperature and order). For that reason, we can look at the constituent minerals in an igneous rock and get an idea of the temperature of the magma when it started to cool. Minerals with high cooling temperatures will not usually be found with low cooling temperature minerals and this may indicate that the magma moved after the highest temperature rocks had crystallized.

Diff: 2

Topic: 3.2 Igneous Rocks: "Formed by Fire"

Bloom's Taxonomy: Application/Analysis

119) Explain why sedimentary rocks are particularly important in studying the past history of the Earth.

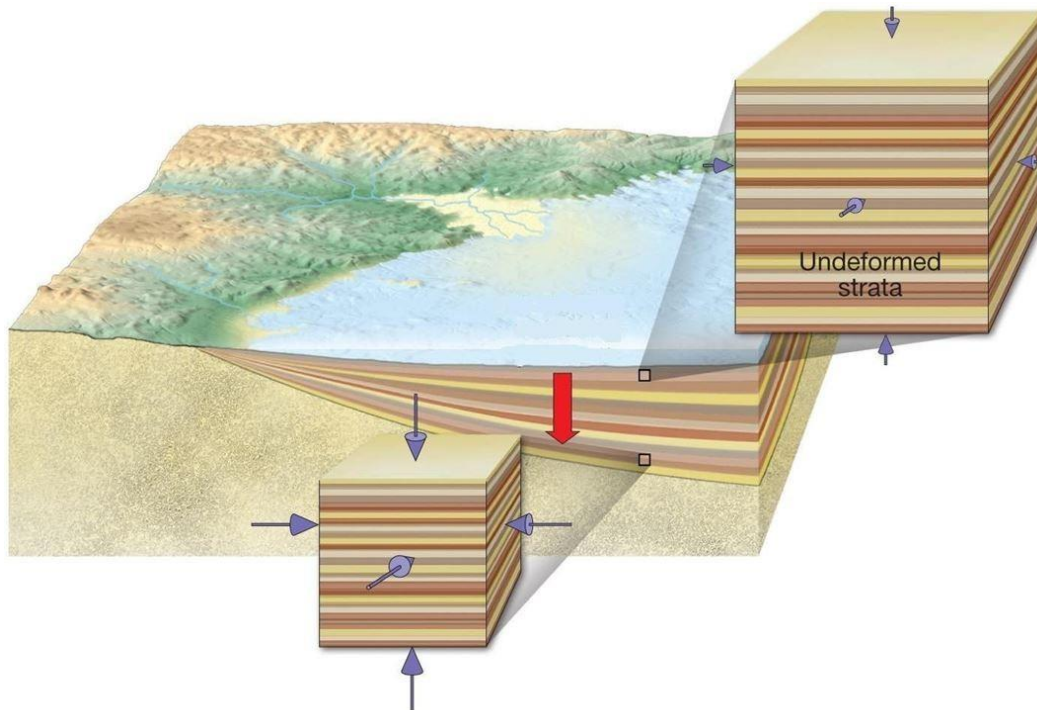
Answer: Sedimentary rocks form at the surface of the Earth, and during that process, they record information about conditions during their formation. For example, a poorly sorted conglomerate will indicate the presence of a rapidly moving stream while a breccia will indicate rock types nearby its depositional site and may also indicate instabilities like earthquakes or landslides because of its rapid deposition. The cements indicate the types of fluids traveling through the rocks, and fossils give information about the environment of deposition.

Diff: 2

Topic: 3.3 Sedimentary Rocks: Compacted and Cemented Sediment

Bloom's Taxonomy: Application/Analysis

120) What type of stress (pressure) is illustrated in the diagram below?



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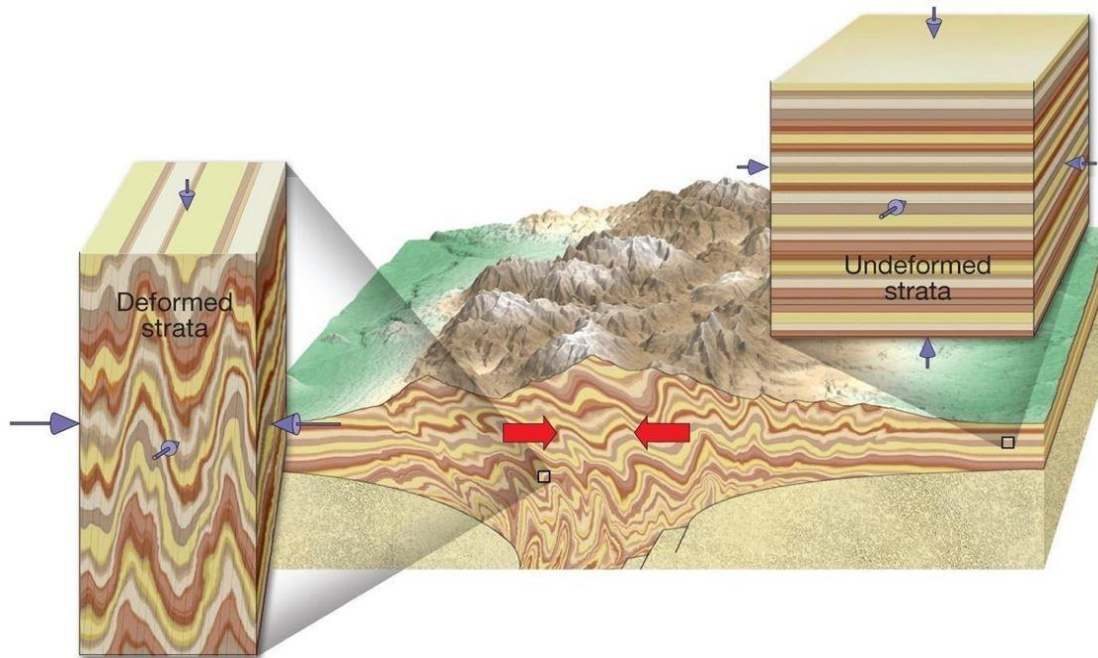
Answer: confining pressure

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Application/Analysis

121) What type of stress (pressure) is illustrated in the diagram below?



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Answer: differential stress

Diff: 1

Topic: 3.4 Metamorphic Rock: New Rock from Old

Bloom's Taxonomy: Application/Analysis