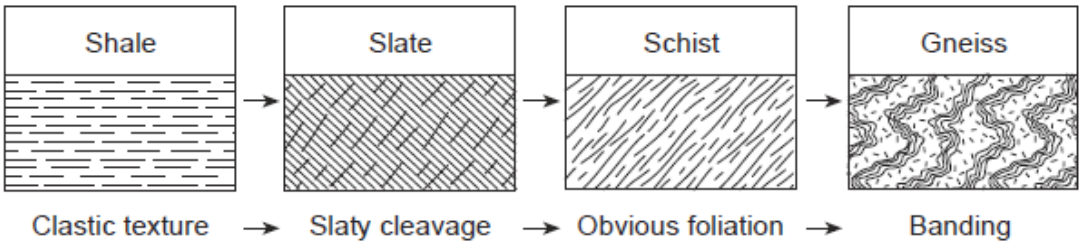
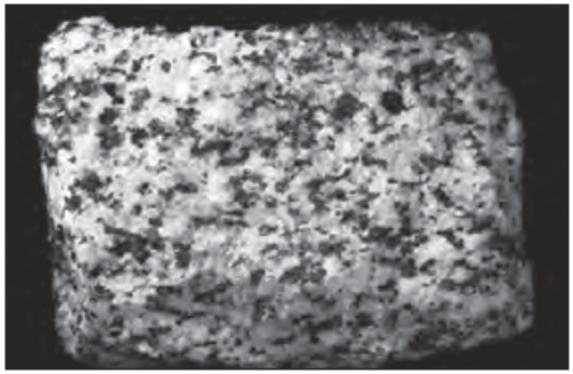
1. The diagram below indicates physical changes that accompany the conversion of shale to gneiss.



Which geologic process is occurring to cause this conversion?

A) sedimentary layering
B) intrusion of magma
C) metamorphism
D) weathering

2. The photograph below shows an igneous rock with mineral crystals ranging in size from 2 to 6 millimeters. The rock is composed of 58% plagioclase feldspar, 26% amphibole, and 16% biotite.



What is the name of this rock?

A) diorite
B) gabbro
C) andesite
D) pumice

3. Which processes lead directly to the formation of igneous rock?

A) weathering and erosion
B) compaction and cementation
C) heat and pressure
D) melting and solidification

4. Particles of sediment collected from a lake bottom averaged 1.2 centimeters in diameter. If left on the lake bottom to become buried by more sediment and compressed into rock, these particles would form

A) sandstone
B) conglomerate
C) quartzite
D) granite

5. Which texture best describes an igneous rock that formed deep underground?

A) glassy
B) vesicular
C) fine grained
D) coarse grained

6. Which home-building material is made mostly from the mineral gypsum?

A) plastic pipes
B) window glass
C) drywall panels
D) iron nails

7. Which type(s) of rock can be the source of deposited sediments?

A) igneous and metamorphic rocks, only
B) metamorphic and sedimentary rocks, only
C) sedimentary rocks, only
D) igneous, metamorphic, and sedimentary rocks

8. Which element, found in both biotite mica and muscovite mica, makes up the greatest percent by volume of Earth's crust?

A) nitrogen
B) oxygen
C) potassium
D) silicon

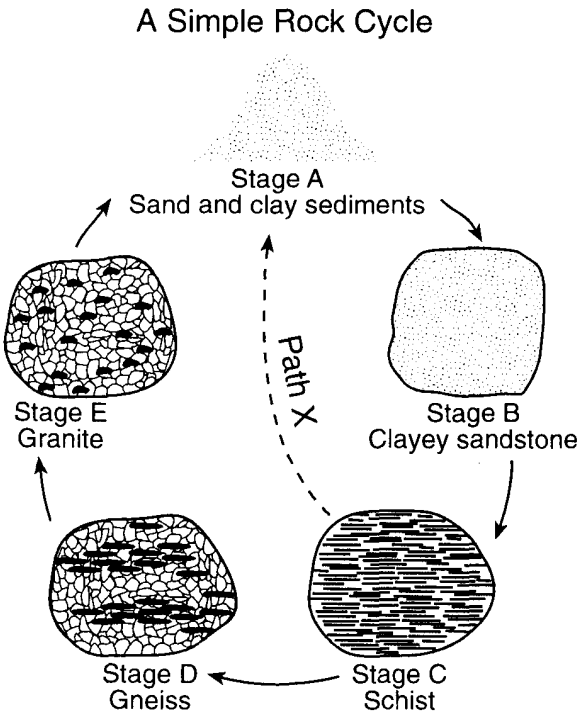
9. Which mineral is commonly mined as a source of the element lead (Pb)?

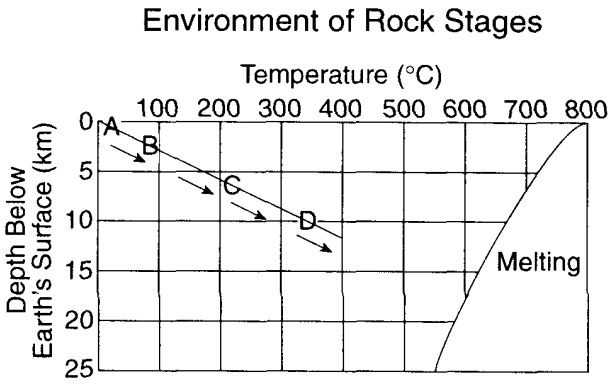
A) galena
B) quartz
C) magnetite
D) gypsum

10. Which of the following elements is not found in Plagioclase Feldspar?

A) Na B) Al C) Si D) Pb

Base your answers to questions **11** through **15** on the diagrams below which represents the same rock material at five stages of development. The graph below shows the temperature and depth of burial at which stages *A* through *D* develop Stage *E* has intentionally been omitted from the graph.





11 The rocks in stages *C* and *D* are both

A) noncrystalline B) foliated C) clastic D) glassy

12 In the simple rock-cycle diagram, which processes along path *X* would change the schist (stage *C*) directly into a pile of sediments (stage *A*)?

A) uplift, weathering, and erosion of the schist
B) cementing of sediment grains followed by compaction
C) melting of the schist followed by cooling
D) heat and/or pressure applied to the schist

13 According to the graph, gneiss is formed at a depth of approximately

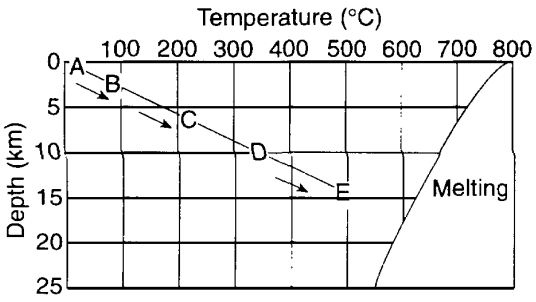
A) 10 km B) 7 km C) 3 km D) 0 km

14 Clayey sandstone will form gneiss if the

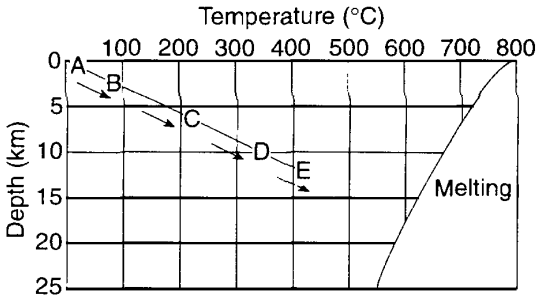
A) temperature and pressure both decrease
B) temperature and pressure both increase
C) temperature decreases and the pressure increases
D) temperature increases and the pressure decreases

15.Which graph correctly shows where magma would begin to crystallize into granite (stage *E*)?

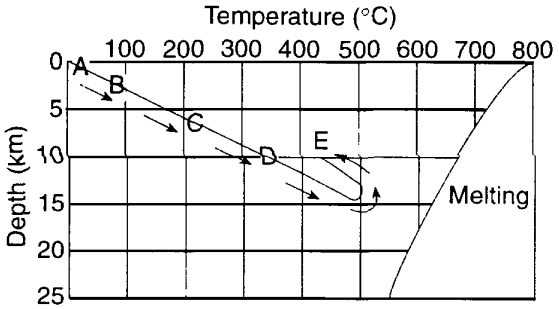
A)



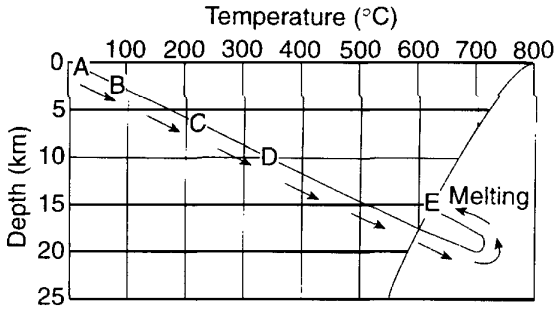
B)



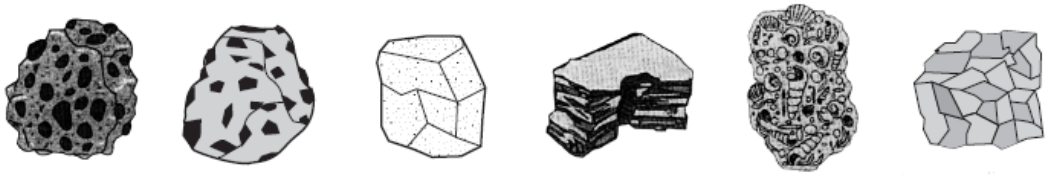
C)



D)



Base your answers to questions **16** through **18** on the drawings of six sedimentary rocks labeled *A* through *F*.



16.Which two rocks are composed primarily of quartz, feldspar, and clay minerals?

A) rock salt and conglomerate
B) rock salt and breccia
C) sandstone and shale
D) sandstone and limestone

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17. Which table shows the rocks correctly classified by texture?

A)

Texture	clastic	bioclastic	crystalline
Rock	A, B, C, D	E	F

B)

Texture	clastic	bioclastic	crystalline
Rock	A, B, C	D	E, F

C)

Texture	clastic	bioclastic	crystalline
Rock	A, C	B, E	D, F

D)

Texture	clastic	bioclastic	crystalline
Rock	A, B, F	E	C, D

18. Most of the rocks shown were formed by

A) volcanic eruptions and crystallization
B) compaction and/or cementation
C) heat and pressure
D) melting and/or solidification

19. Which rock is composed of the mineral halite that formed when seawater evaporated?

A) limestone B) dolostone C) rock gypsum D) rock salt

Base your answers to questions **20** through **22** on the mineral chart below and on your knowledge of Earth science. The mineral chart lists some properties of five minerals that are the major sources of the same metallic element that is used by many industries.

Mineral Chart

Mineral Name	Composition	Density (g/cm^3)	Hardness	Streak	Nonmetallic Luster	Common Colors
brucite	$Mg(OH)_2$	2.4	2.5-3	white	glassy to waxy	white
carnallite	$KMgCl_3 \cdot 6H_2O$	1.6	2.5	white	greasy	white
dolomite	$CaMg(CO_3)_2$	2.8	3.5-4	white	glassy to waxy	shades of pink
magnesite	$MgCO_3$	3.1	3.5-4.5	white	glassy	white
olivine	$(Fe,Mg)_2SiO_4$	3.3	6.5	white	glassy	green

20. Which two minerals have compositions that are most similar to calcite?

A) brucite and carnallite
B) carnallite and dolomite
C) dolomite and magnesite
D) magnesite and olivine

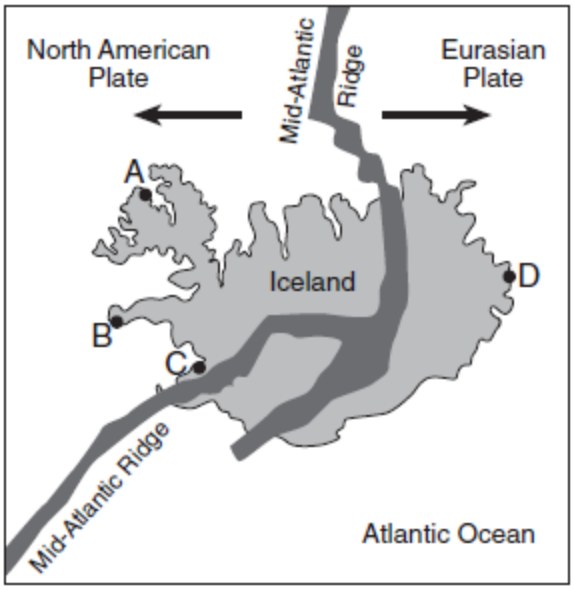
21. Which mineral might scratch the mineral fluorite, but would *not* scratch the mineral amphibole?

A) brucite B) magnesite C) carnallite D) olivine

22. Which mineral has a different common color from its color in powdered form?

A) brucite B) canallite C) magnesite D) olivine

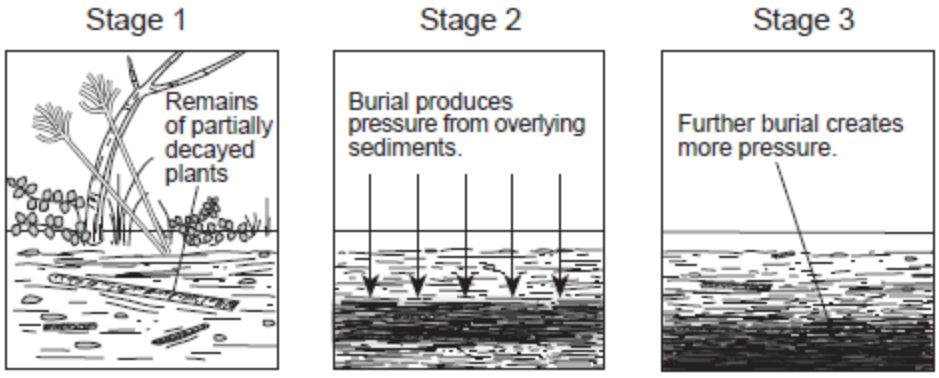
23. Base your answer to the following question on the map below of Iceland, a country located on the Mid-Atlantic Ridge. Four locations are represented by the letters *A* through *D*.



The fine-grained texture of most of the igneous rock formed on the surface of Iceland is due to

A) rapid cooling of the molten rock B) high density of the molten rock
C) numerous faults in the island's bedrock D) high pressure under the island

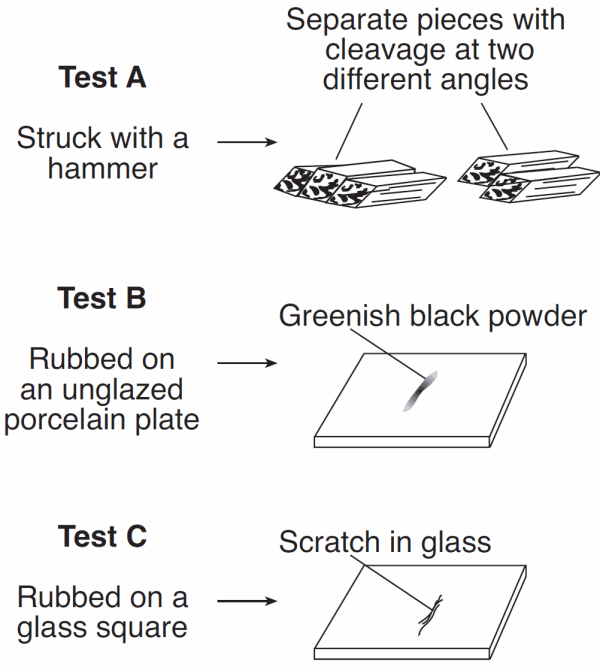
24. The diagram below shows three stages in the formation of a specific rock.



Which rock is formed as a result of these three stages?

A) limestone B) gneiss C) schist D) coal

Base your answers to questions **25** and **26** on the diagram below, which shows the results of three different physical tests, *A*, *B*, and *C*, that were performed on a mineral.



25. Which mineral was tested?

A) amphibole B) quartz C) galena D) graphite

26. The luster of this mineral could be determined by

A) using an electronic balance
B) using a graduated cylinder
C) observing how light reflects from the surface of the mineral
D) observing what happens when acid is placed on the mineral

27. The rock shown below has a foliated texture and contains the minerals amphibole, quartz, and feldspar arranged in coarse-grained bands.

Which rock is shown?

A) slate B) dunite
C) gneiss D) quartzite

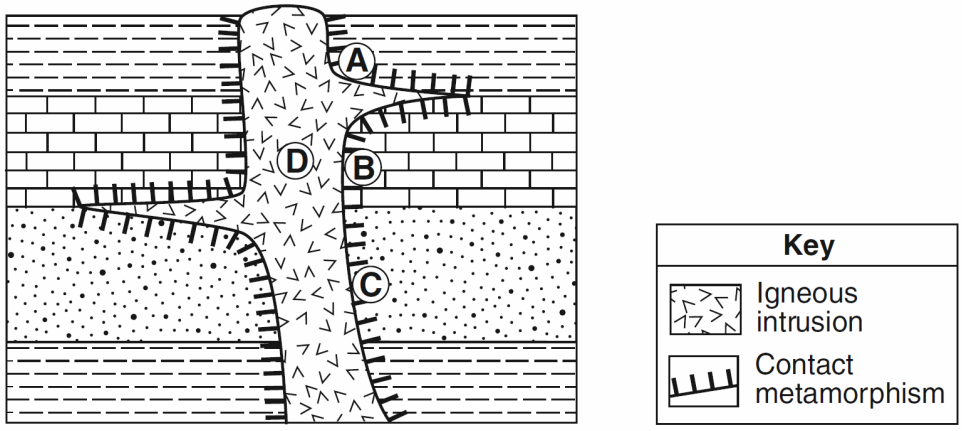
28. The minerals talc, muscovite mica, quartz, and olivine are similar because they

A) have the same hardness
B) are the same color
C) contain silicon and oxygen
D) break along cleavage planes

29. Dolostone is formed by the

A) local metamorphism of marble
B) biological deposition of skeletons and shells
C) chemical replacement of limestone
D) mechanical deposition of silts

30. The cross section below represents a portion of Earth's crust. Letters *A* through *D* are locations within the rock units.



At which location is quartzite most likely found?

A) *A* B) *B* C) *C* D) *D*

31. The photograph below shows a broken piece of the mineral calcite.

The calcite breaks in smooth, flat surfaces because calcite

A) is very dense
B) is very soft
C) contains certain impurities
D) has a regular arrangement of atoms

32. The photograph below shows an igneous rock.

What is the origin and rate of formation of this rock?

A) plutonic with slow cooling
B) plutonic with rapid cooling
C) volcanic with slow cooling
D) volcanic with rapid cooling

33. The fossil below was found in surface bedrock in the eastern United States.

Which statement best describes the formation of the rock containing this fossil?

A) The rock was formed by the metamorphism of sedimentary rock deposited in a terrestrial environment during the Cretaceous Period.
B) The rock was formed by the compaction and cementation of sediments deposited in a terrestrial environment during the Triassic Period.
C) The rock was formed by the compaction and cementation of sediments deposited in a marine environment during the Cambrian Period.
D) The rock was formed from the solidification of magma in a marine environment during the Triassic Period.

34. A student created the table below by classify six minerals into two groups, *A* and *B* , based on a single property.

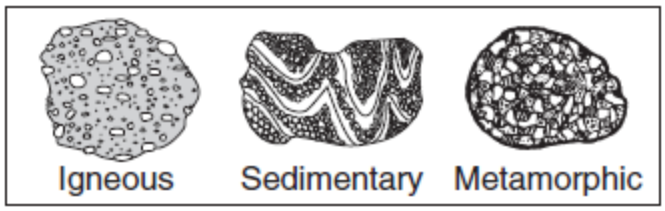
Group A	Group B
olivine	pyrite
garnet	galena
calcite	graphite

Which property was used to classify' these minerals?

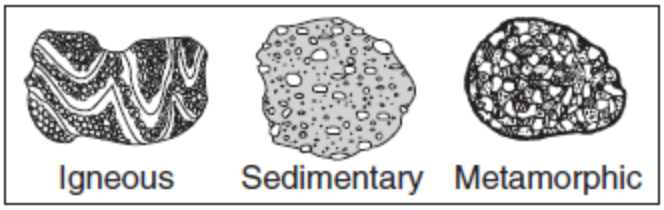
A) color
B) luster
C) chemical composition
D) hardness

35. In which set are the rock drawings labeled with their correct rock types?

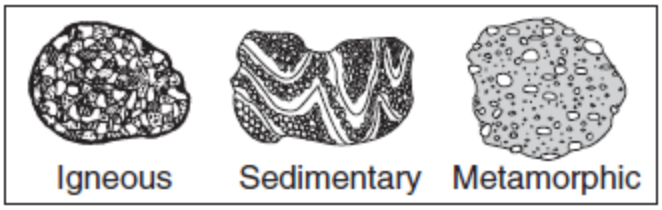
A)



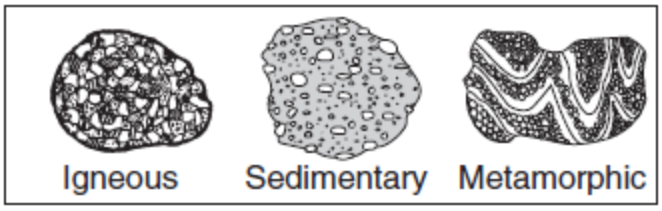
B)



C)



D)



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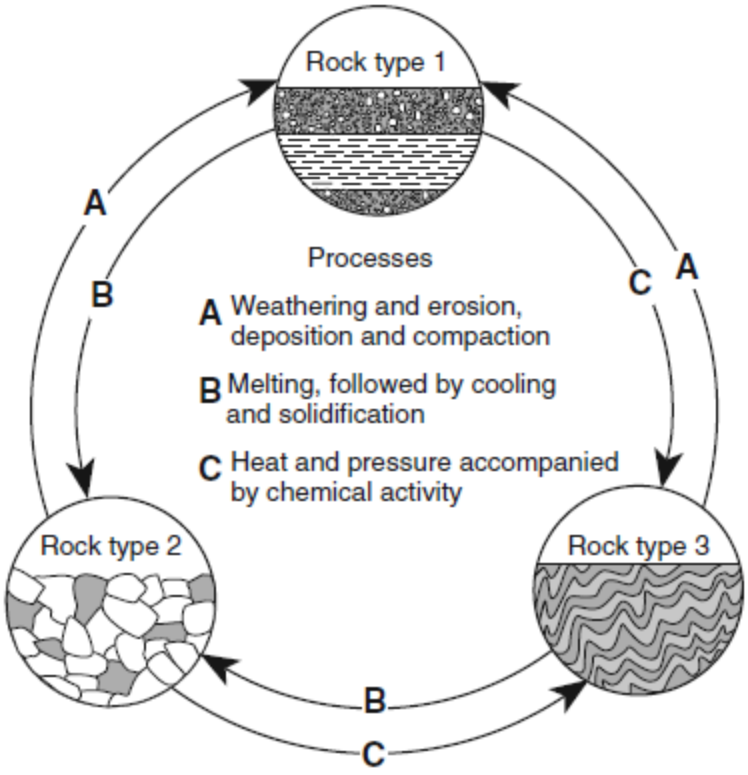
36. The diagram below represents geological processes that act continuously on Earth to form different rock types.



Which table correctly classifies each rock type?

A)

Rock Type	Classification
1	sedimentary
2	metamorphic
3	igneous

B)

Rock Type	Classification
1	sedimentary
2	igneous
3	metamorphic

C)

Rock Type	Classification
1	metamorphic
2	igneous
3	sedimentary

D)

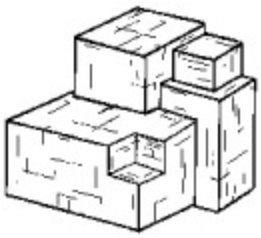
Rock Type	Classification
1	igneous
2	metamorphic
3	sedimentary

37. Base your answer to the following question on the data table below and on your knowledge of Earth science. The table provides information about four minerals, *A* through *D*.

Data Table

Mineral	Breakage	Hardness	Luster	Color
A	cleavage	2.5	metallic	silver
B	cleavage	2.5	nonmetallic	black
C	cleavage	3	nonmetallic	colorless
D	fracture	6.5	nonmetallic	green

The diagram below represents a sample of mineral *A*.



Mineral *A* is most likely

A) garnet B) galena C) olivine D) halite