

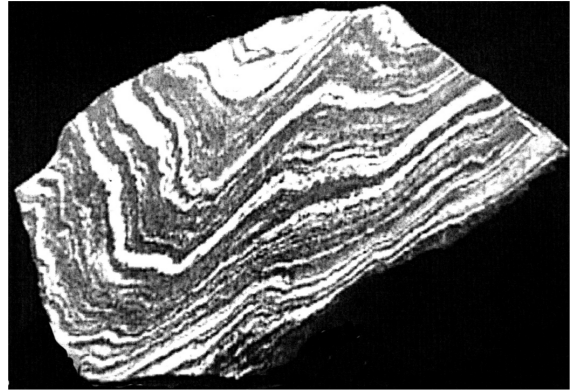
## Unit 2: Minerals and Rocks Practice Questions

Name: \_\_\_\_\_

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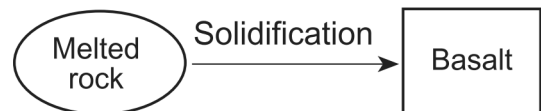
- Which mineral is white or colorless, has a hardness of 2.5, and splits with cubic cleavage?
  - calcite
  - halite
  - pyrite
  - mica
- Most rock gypsum is formed by the
  - heating of previously existing foliated bedrock
  - cooling and solidification of lava
  - compaction and cementation of shells and skeletal remains
  - chemical precipitation of minerals from seawater
- Which igneous rock has a vesicular texture and a felsic composition?
  - pumice
  - basalt
  - granite
  - scoria
- Rocks are classified as igneous, sedimentary, or metamorphic based primarily on their
  - texture
  - crystal or grain size
  - method of formation
  - mineral composition
- Which three minerals are most commonly found in the igneous rock granite?
  - amphibole, calcite, and hematite
  - amphibole, biotite mica, and gypsum
  - plagioclase feldspar, pyroxene, and olivine
  - plagioclase feldspar, potassium feldspar, and

- Base your answer(s) to the following question(s) on the photograph of a sample of gneiss below.



Identify *two* minerals found in gneiss that contain iron and magnesium.

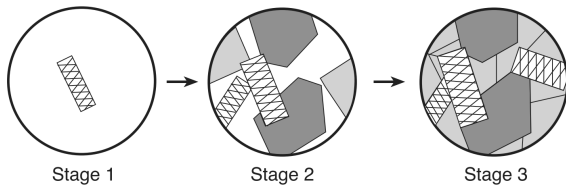
- Which two processes lead directly to the formation of both breccia and conglomerate?
  - melting and solidification
  - heat and pressure
  - compaction and cementation
  - evaporation and precipitation
- The flowchart below illustrates the change from melted rock to basalt.



The solidification of the melted rock occurred

- slowly, resulting in fine-grained minerals
- slowly, resulting in coarse-grained minerals
- rapidly, resulting in coarse-grained minerals
- rapidly, resulting in fine-grained minerals

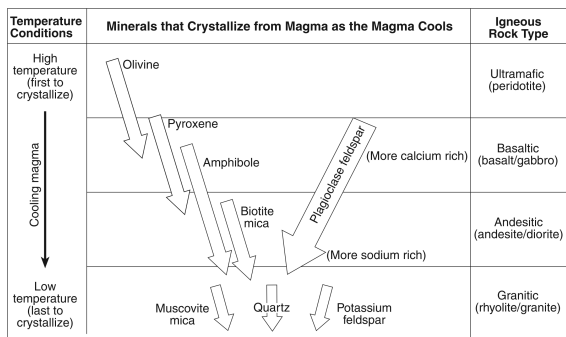
9. The diagram below shows magnified views of three stages of mineral crystal formation as molten material gradually cools.



Which rock normally forms when minerals crystallize in these stages?

- A. shale                      B. gneiss  
C. gabbro                      D. breccia
10. Base your answer(s) to the following question(s) on the diagram of Bowen's Reaction Series below, which shows the sequence in which minerals crystallize as magma cools and forms different types of igneous rocks from the same magma. The arrow for each mineral represents the relative temperature range at which that mineral crystallizes.

**Bowen's Reaction Series**



Describe the temperature conditions shown in Bowen's Reaction Series that explain why olivine and quartz are *not* usually found in the same igneous rock type.

11. Which property of a mineral most directly results from the internal arrangements of its atoms?
- A. volume                      B. color  
C. crystal shape              D. streak

12. Which rock is foliated, shows mineral alignment but not banding, and contains medium-sized grains of quartz and pyroxene?

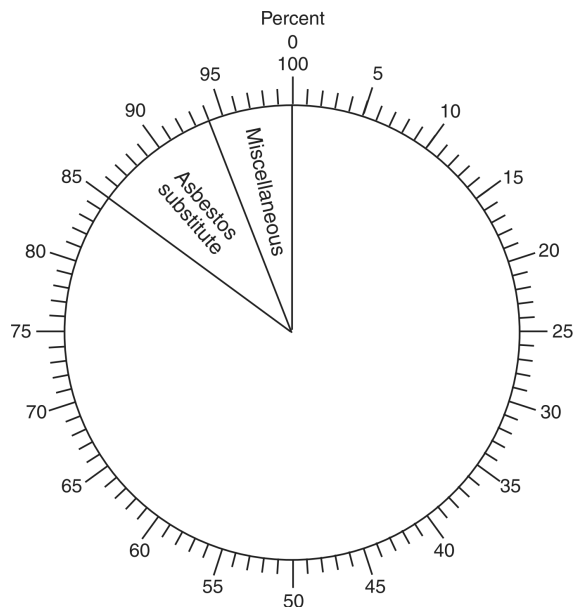
- A. phyllite                      B. schist  
C. gneiss                        D. quartzite

13. Base your answer(s) to the following question(s) on your knowledge of Earth science and on the data table, which shows the industrial uses of wollastonite, a mineral mined in the eastern Adirondack Mountains of New York State.

**Industrial Uses of Wollastonite in the United States**

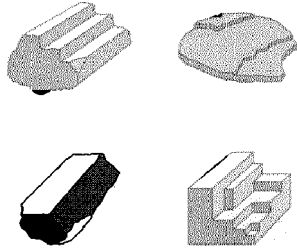
Industrial Uses of Wollastonite	Percent of Total Use
Plastics	37
Ceramics	28
Metallurgy	10
Paint	10
Asbestos substitute	9
Miscellaneous	6

On the pie graph provided below, complete the graph to show the percent of *each* industrial use of wollastonite. Label *each* section of the pie graph with its industrial use. The percent for Miscellaneous and for Asbestos substitute has been drawn and labeled for you.



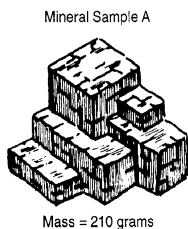
14. The internal atomic structure of a mineral most likely determines the mineral's
- color, streak, and age
  - origin, exposure, and fracture
  - size, location, and luster
  - hardness, cleavage, and crystal shape
15. Which home-building material is made mostly from the mineral gypsum?
- plastic pipes
  - window glass
  - drywall panels
  - iron nails
16. Biotite mica and muscovite mica have different chemical compositions. Compared to the magma from which biotite mica forms, the magma from which muscovite mica forms is usually
- more mafic and less dense
  - more mafic and more dense
  - more felsic and less dense
  - more felsic and more dense
17. Wavy bands of light and dark minerals visible in gneiss bedrock probably formed from the
- cementing together of individual mineral grains
  - cooling and crystallization of magma
  - evaporation of an ancient ocean
  - heat and pressure during metamorphism
18. Silicate minerals contain the elements silicon and oxygen. Which list contains only silicate minerals?
- graphite, talc, and selenite gypsum
  - potassium feldspar, quartz, and amphibole
  - calcite, dolomite, and pyroxene
  - biotite mica, fluorite, and garnet
19. Which mineral can be found in all samples of rhyolite and andesite?
- pyroxene
  - quartz
  - biotite
  - potassium feldspar
20. Which minerals contain the two most abundant elements by mass in Earth's crust?
- fluorite and calcite
  - magnetite and pyrite
  - amphibole and quartz
  - galena and sulfur
21. Which mineral property is illustrated by the peeling of muscovite mica into thin, flat sheets?
- luster
  - streak
  - hardness
  - cleavage
22. Scratching a mineral against a glass plate and rubbing a mineral on a streak plate are helpful procedures for determining a mineral's
- density
  - identity
  - cleavage
  - internal atomic structure
23. Base your answer(s) to the following question(s) on the "Properties of Common Minerals" chart in the *Earth Science Reference Tables*.
- Which mineral scratches dolomite and is scratched by olivine?
- galena
  - quartz
  - potassium feldspar
  - muscovite mica

24. Which mineral leaves a green-black powder when rubbed against an unglazed porcelain plate?
- A. galena                      B. graphite  
C. hematite                    D. pyrite
25. The diagrams below represent fractured samples of four minerals.



Which mineral property is best illustrated by the samples?

- A. harness                      B. streak  
C. cleavage                      D. density
26. Base your answer(s) to the following question(s) on the *Earth Science Reference Tables*, the diagram and table below, and your knowledge of Earth science.



Mineral	Density (g/cm <sup>3</sup> )	Mineral	Density (g/cm <sup>3</sup> )
Gypsum	2.3	Hornblende	3.2
Orthoclase	2.6	Chalcopyrite	4.2
Quartz	2.7	Pyrite	5.0
Calcite	2.7	Magnetite	5.2
Dolomite	2.9	Galena	7.5
Fluorite	3.2	Copper	8.9

If the volume of mineral sample A is 28 cubic centimeters, sample A is most likely

- A. copper                      B. galena  
C. chalcopyrite              D. dolomite
27. The original shape of mineral sample A was altered when it was hit with a rock hammer. Which physical property caused the mineral to break as it did?
- A. hardness                    B. luster  
C. cleavage                      D. streak

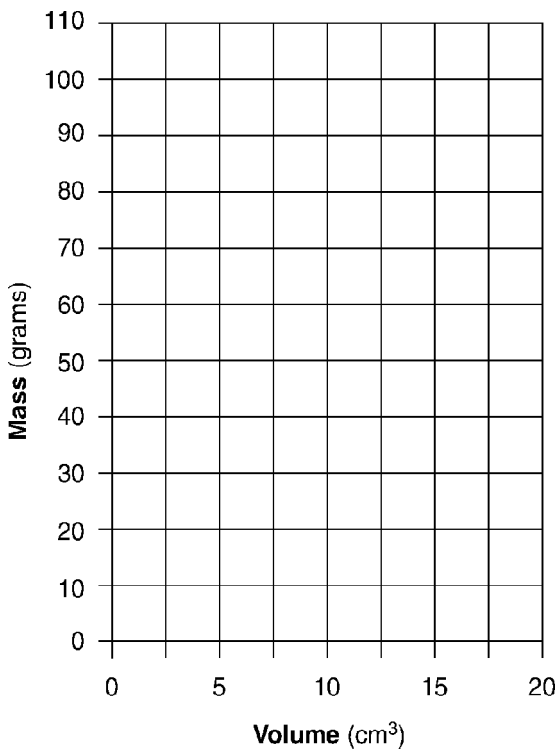
28. A student measured the mass of a sample of quartz three times. The mass was the same the first and second times, but was less the third time. This decrease in mass could have occurred before the third measurement if the sample had been
- A. heated and expanded  
B. cooled and extracted  
C. soaked in water  
D. dropped and a piece was lost
29. Under identical conditions, several samples of the mineral pyrite are measured, and their densities are compared. The values obtained should show that
- A. rounded samples are more dense than rough samples  
B. large samples are more dense than small samples  
C. small samples are more dense than large samples  
D. all the pyrite samples have the same density
30. When a sample of the mineral calcite is heated, it expands, causing its density to be
- A. less than 2.7 g/cm<sup>3</sup>  
B. exactly 2.7 g/cm<sup>3</sup>  
C. between 2.7 and 3.0 g/cm<sup>3</sup>  
D. greater than 3.0 g/cm<sup>3</sup>
31. Which property of the mineral diamond allows diamond powder to be used to shape gems for jewelry?
- A. crystal shape              B. cleavage  
C. luster                          D. hardness

32. A mineral's crystal shape and cleavage are a direct result of the mineral's
- A. hardness
  - B. abundance in nature
  - C. arrangement of atoms
  - D. exposure to the hydrosphere and atmosphere

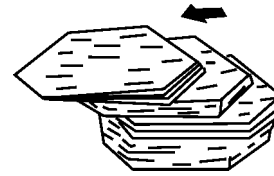
33. Base your answer(s) to the following question(s) on the data table below, which shows the volume and mass of three different samples, A, B, and C, of the mineral pyrite.

Pyrite		
Sample	Volume (cm <sup>3</sup> )	Mass (g)
A	2.5	12.5
B	6.0	30.0
C	20.0	100.0

On the grid below, plot the data (volume and mass) for the *three* samples of pyrite and connect the points with a line.



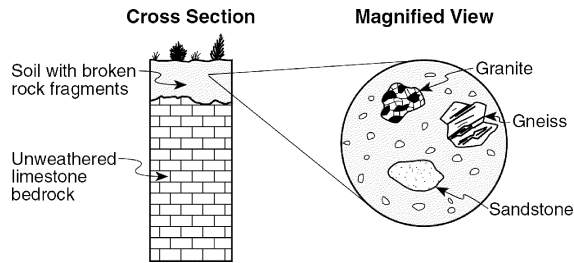
34. The accompanying diagram shows how a sample of the mineral mica breaks when hit with a rock hammer.



This mineral breaks in smooth, flat surfaces because it

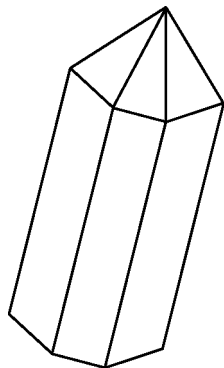
- A. is very hard
  - B. is very dense
  - C. contains large amounts of iron
  - D. has a regular arrangement of atoms
35. Which mineral will scratch glass (hardness = 5.5), but not pyrite?
- A. gypsum
  - B. fluorite
  - C. orthoclase
  - D. quartz
36. What is the best way to determine if a mineral sample is calcite or quartz?
- A. Observe the color of the mineral.
  - B. Place the mineral near a magnet.
  - C. Place a drop of acid on the mineral.
  - D. Measure the mass of the mineral.
37. A human fingernail has a hardness of approximately 2.5. Which two minerals are softer than a human fingernail?
- A. calcite and halite
  - B. sulfur and fluorite
  - C. graphite and talc
  - D. pyrite and magnetite

38. Base your answer(s) to the following question(s) on the cross section below, which shows an area near Watertown, New York. The top layer of soil contains broken rock fragments. A representative sample of this layer has been magnified.

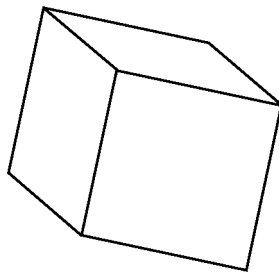


State *one* observable characteristic, other than mineral composition, that could help identify the gneiss fragment.

39. The mineral graphite is often used as
- a lubricant
  - an abrasive
  - a source of iron
  - a cementing material
40. The diagrams below show the crystal shapes of two minerals.



Quartz



Halite

Quartz and halite have different crystal shapes primarily because

- light reflects from crystal surfaces
- energy is released during crystallization
- of impurities that produce surface variations
- of the internal arrangement of the atoms

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

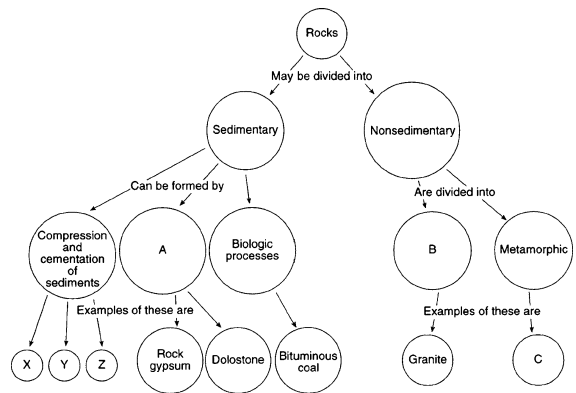
Group A	Group B
olivine	pyrite
garnet	galena
calcite	graphite

Which property was used to classify these minerals?

- color
  - luster
  - chemical composition
  - hardness
42. Which rock type is most likely to be monomineralic?
- rock salt
  - rhyolite
  - basalt
  - conglomerate
43. Bedrock in the area of Binghamton, New York, consists of
- plutonic igneous rock
  - sedimentary rock layers
  - faulted and tilted volcanic rock
  - folded metamorphic rock
44. What occurs when a rock is crushed into a pile of fragments?
- The total surface area decreases and chemical composition changes
  - the total surface area decreases and chemical composition remains the same
  - The total surface area increases and chemical composition changes
  - The total surface area increases and chemical composition remains the same

45. Which rocks usually have the mineral quartz as part of their composition?
- conglomerate, gabbro, rock salt, and schist
  - breccia, fossil limestone, bituminous coal, and siltstone
  - shale, scoria, gneiss, and marble
  - granite, rhyolite, sandstone, and hornfels
46. Which sedimentary rock may have both a chemical origin and an organic origin?
- limestone
  - rock gypsum
  - rock salt
  - shale
47. Which mineral can be found in granite, andesite, gneiss, and hornfels?
- quartz
  - pyroxene
  - olivine
  - biotite mica
48. Which rock is made up of angular fragments of rock held together by a natural cement?
- breccia
  - scoria
  - granite
  - quartzite
49. Which relative concentration of elements is found in a mafic rock?
- a high concentration of silicon and a low concentration of iron
  - a high concentration of iron and a low concentration of aluminum
  - a high concentration of aluminum and a low concentration of iron
  - a high concentration of aluminum and a low concentration of magnesium

50. Base your answer(s) to the following question(s) on the *Earth Science Reference Tables*, the diagram below, and your knowledge of Earth science. The diagram represents a scheme for classifying rocks. The letters A, B, C and X, Y, Z represent missing labels.



Dolostone and granite are similar because both are

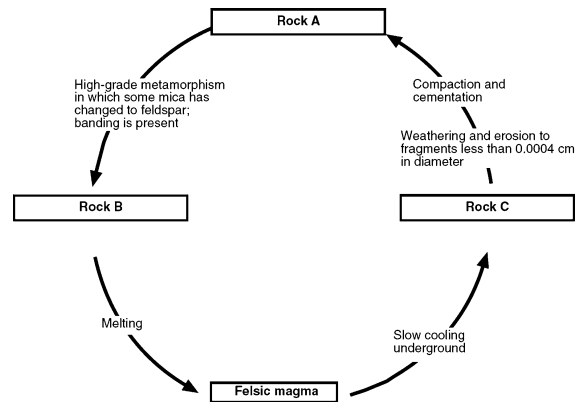
- monomineralic
  - clastic
  - foliated
  - crystalline
51. The classification of rocks into sedimentary or nonsedimentary groups is based primarily on the rocks'
- origin
  - density
  - color
  - age
52. Which type of rock is represented by the accompanying map symbol?



- elastic sedimentary rock formed from organic substances
- chemically formed sedimentary rock that consists mainly of the mineral calcite
- regional metamorphic prock with blocklike foliation
- contact metamorphic rock that results from the alteration of limestone by contact with an igneous intrusion

53. Which extrusive igneous rock is composed of approximately 40% quartz, 20% potassium feldspar, 20% plagioclase feldspar, 10% biotite mica, and 10% hornblende?
- A. rhyolite                      B. gabbro  
C. granite                         D. basalt
54. A rock is composed of several large, rounded pebbles and sand grains cemented together. Which inference about the rock is best supported by this description?
- A. The rock is older than the pebbles.  
B. The rock is igneous.  
C. The rock is sedimentary.  
D. The rock resulted from evaporation of seawater.
55. Which type of rock is most likely to contain fossils?
- A. granite                         B. gneiss  
C. shale                          D. metaconglomerate
56. Which texture best describes an igneous rock that formed deep underground?
- A. glassy                         B. vesicular  
C. fine grained                 D. coarse grained
57. What are the two most abundant elements by mass found in Earth's crust?
- A. aluminum and iron  
B. sodium and chlorine  
C. calcium and carbon  
D. oxygen and silicon

58. Base your answer(s) to the following question(s) on the rock cycle diagram below.



State the specific names of rocks A, B, and C in the diagram. Do *not* write the terms “sedimentary,” “igneous,” and “metamorphic.”

59. Base your answer(s) to the following question(s) on the “Properties of Common Minerals” chart in the *Earth Science Reference Tables*.
- Minerals from this chart are found in several different rocks. Which two rocks are primarily composed of a mineral that bubbles with acid?
- A. limestone and marble  
B. granite and dolostone  
C. sandstone and quartzite  
D. slate and conglomerate
60. Rocks can be classified as sedimentary, igneous, or metamorphic based primarily upon differences in their
- A. color                             B. density  
C. origin                            D. age
61. Which phrase best describes coal?
- A. low density, mafic  
B. chemical precipitate  
C. organic plant remains  
D. glassy texture, volcanic