

REGENTS REVIEW PACKETS

Name \_\_\_\_\_ Partner \_\_\_\_\_  
Partner \_\_\_\_\_ Partner \_\_\_\_\_

Packet Number: \_\_\_\_\_ Score \_\_\_\_\_

Material Covered: Topic 11 - Minerals and Rocks

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| 22) _____ | 44) _____ | 66) _____ |

# Minerals and Rocks

- According to the *Earth Science Reference Tables*, which type of sedimentary rock contains the greatest range of particle sizes?
  - conglomerate
  - sandstone
  - sandstone
  - siltstone
- According to the *Earth Science Reference Tables*, which characteristic determines whether a rock is classified as a shale, a siltstone, a sandstone, or a conglomerate?
  - the absolute age of the sediments within the rock
  - the mineral composition of the sediments within the rock
  - the particle size of the sediments within the rock
  - the density of the sediments within the rock
- According to the *Earth Science Reference Tables*, particles of which size could have formed shale?
  - 0.2 cm
  - 0.02 cm
  - 0.002 cm
  - 0.0002 cm
- Which characteristic is most common in sedimentary rocks?
  - foliation
  - layering
  - intergrown crystals
  - glassy texture
- Which rock type is most likely to be monomineralic?
  - rock salt
  - rhyolite
  - basalt
  - conglomerate
- Which sedimentary rock is formed by compaction and cementation of land-derived sediments?
  - siltstone
  - dolostone
  - rock salt
  - rock gypsum
- Larger crystal size in one of two igneous rocks of similar composition usually indicates that the rock with the larger crystals cooled for
  - a shorter period of time than the other
  - a longer period of time than the other
  - the same amount of time as the other
- A fine-grained rock has the following mineral composition:

50 percent potassium feldspar, 26 percent quartz, 13 percent plagioclase, 8 percent biotite, and 3 percent hornblende.

The rock would most likely be

  - granite
  - rhyolite
  - gabbro
  - basalt
- According to the *Earth Science Reference Tables*, which is a fine-grained igneous rock made up primarily of pyroxene and plagioclase feldspar?
  - gabbro
  - basalt
  - granite
  - rhyolite
- According to the "Scheme for Igneous Rock Identification" in the *Earth Science Reference Tables*, which statement best describes the percentage of plagioclase feldspars in a sample of gabbro?
  - The percentage of plagioclase feldspars in gabbro can vary.
  - Gabbro always contains less plagioclase than pyroxene.
  - Plagioclase feldspars always make up 25% of a gabbro sample.
  - Gabbro contains no plagioclase feldspars.
- Which statement best describes a general property of rocks?
  - Most rocks have a number of minerals in common.
  - Most rocks are composed of a single mineral.
  - All rocks contain fossils.
  - All rocks contain minerals formed by compression and cementation.
- According to the *Earth Science Reference Tables*, rhyolite and granite are alike in that they both are
  - fine-grained
  - dark-colored
  - mafic
  - felsic
- What do most igneous, sedimentary, and metamorphic rocks have in common?
  - They are formed from molten material.
  - They are produced by heat and pressure.
  - They are composed of minerals.
  - They exhibit crystals, banding, and distinct layers.
- Base your answer to the following question on the *Earth Science Reference Tables*.

The green sand found on some Hawaiian Island shorelines most probably consists primarily of

  - quartz
  - olivine
  - plagioclase feldspar
  - orthoclase feldspar
- Which two igneous rocks could have the same mineral composition?
  - rhyolite and diorite
  - pumice and scoria
  - peridotite and andesite
  - gabbro and basalt
- In which group do the rocks usually have the mineral quartz as part of their composition?
  - granite, rhyolite, sandstone, hornfels
  - shale, scoria, gneiss, metaconglomerate
  - conglomerate, gabbro, rock salt, schist
  - breccia, fossil limestone, bituminous coal, siltstone

17. A mineral's crystal shape and cleavage are a direct result of the mineral's

- (1) hardness
- (2) abundance in nature
- (3) arrangement of atoms
- (4) exposure to the hydrosphere and atmosphere

18. Base your answer to the following question on the *Earth Science Reference Tables* and on your knowledge of Earth Science.

A fine-grained igneous rock composed mostly of plagioclase feldspar and hornblende and containing no quartz or pyroxene would be classified as

- (1) granite
- (2) andesite
- (3) peridotite
- (4) scoria

19. Minerals are identified on the basis of

- (1) the method by which they were formed
- (2) the type of rock in which they are found
- (3) the size of their crystals
- (4) their physical and chemical properties

20. The mineral mica breaks evenly along flat sheets mainly because of its

- (1) atomic arrangement
- (2) chemical composition
- (3) hardness
- (4) density

21. Which mineral property is illustrated by the peeling of muscovite mica into thin, flat sheets?

- (1) luster
- (2) streak
- (3) hardness
- (4) cleavage

22. Base your answer to the following question on the *Earth Science Reference Tables*.

Which mineral bubbles when acid is placed on it?

- (1) Calcite
- (2) Pyroxene
- (3) Potassium Feldspar
- (4) Garnet

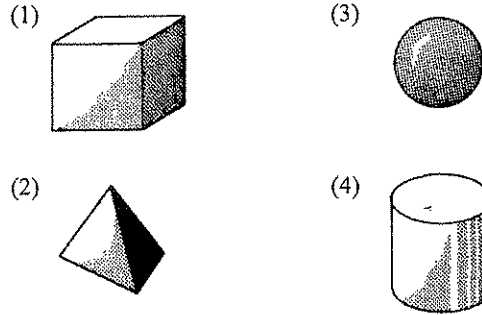
23. Which two elements listed below are most abundant by weight in the Earth's crust?

- (1) silicon and oxygen
- (2) hydrogen and iron
- (3) oxygen and magnesium
- (4) hydrogen and calcium

24. Oxygen is the most abundant element by volume in the Earth's

- (1) inner core
- (2) troposphere
- (3) hydrosphere
- (4) crust

25. Which object is the best model of the shape of a silicon-oxygen structural unit?



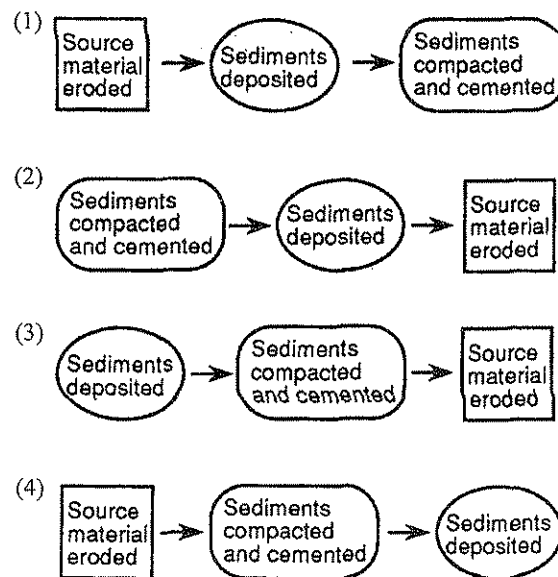
26. Two mineral samples have different physical properties, but each contains silicate tetrahedrons as its basic structural unit. Which statement about the two mineral samples must be true?

- (1) They have the same density.
- (2) They are similar in appearance.
- (3) They contain silicon and oxygen.
- (4) They are the same mineral.

27. Two minerals made of pure carbon are diamond and graphite. Which statement best explains why diamond is so much more resistant to scratching than graphite?

- (1) The atoms are lighter in graphite than in diamond.
- (2) The atoms are heavier in graphite than in diamond.
- (3) The atoms are bonded together more strongly in diamond than in graphite.
- (4) The atoms are smaller in graphite than in diamond.

28. According to the *Earth Science Reference Tables*, which sequence of events occurs in the formation of a sedimentary rock?



29. According to the *Earth Science Reference Tables*, which sedimentary rock formed from the compaction and cementation of fragments of the skeletons and shells of sea organisms?

- (1) shale (3) limestone  
(2) gypsum (4) conglomerate

30. Which type of rock is likely to show ripple marks and fossils?

- (1) intrusive igneous (3) metamorphic  
(2) extrusive igneous (4) sedimentary

31. Which statement about the formation of a rock is best supported by geologic evidence?

- (1) Magma must be weathered before it can change to metamorphic rock.  
(2) Sediment must be compacted and cemented before it can change to sedimentary rock.  
(3) Sedimentary rock must melt before it can change to metamorphic rock.  
(4) Metamorphic rock must melt before it can change to sedimentary rock.

32. Which rock is made up of angular fragments of rock held together by a natural cement?

- (1) breccia (3) granite  
(2) scoria (4) quartzite

33. According to the *Earth Science Reference Tables*, which sedimentary rock could form as a result of evaporation?

- (1) conglomerate (3) shale  
(2) sandstone (4) limestone

34. Large rock salt deposits in the Syracuse area indicate that the area once had

- (1) large forests  
(2) a range of volcanic mountains  
(3) many terrestrial animals  
(4) a warm, shallow sea

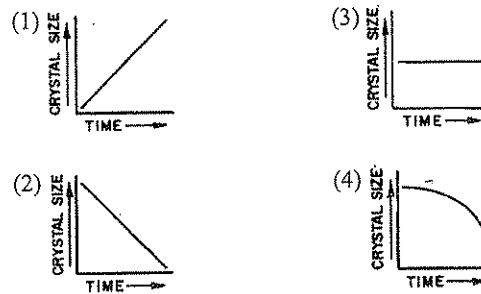
35. Large deposits of rock gypsum and rock salt usually form in areas of

- (1) active volcanoes (3) fault zones in the crust  
(2) continental ice sheets (4) shallow evaporating seas

36. Which would most likely occur during the formation of igneous rock?

- (1) compression and cementation of sediments  
(2) recrystallization of unmelted material  
(3) solidification of molten materials  
(4) evaporation and precipitation of sediments

37. Which graph best shows the relationship between the size of the crystals in an igneous rock and the length of time it has taken the rock to solidify?



38. According to the "Scheme for Igneous Rock Identification" in the *Earth Science Reference Tables*, basalt contains the greatest quantity of which mineral?

- (1) pyroxene (3) potassium feldspar  
(2) mica (4) quartz

39. Large crystal grains in an igneous rock indicate that the rock was formed

- (1) near the surface (3) at a low temperature  
(2) under low pressure (4) over a long period of time

40. According to the Scheme for Igneous Rock Identification, compared to basalt, granite is

- (1) lighter in color  
(2) greater in density  
(3) more mafic in composition  
(4) more fine grained in texture

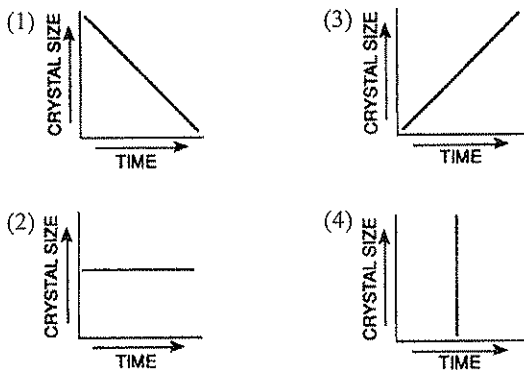
41. Large crystals in an igneous rock most likely form as a result of the

- (1) mineral composition of the magma  
(2) cooling rate of the magma  
(3) fossil content of the rock  
(4) color of the rock

42. According to the *Earth Science Reference Tables*, which substances could be found in the same igneous rock?

- (1) pebbles and cobbles  
(2) sandstone and limestone  
(3) plagioclase feldspar and pyroxene  
(4) quartz and olivine

43. Which graph best represents the relationship between the length of time molten magma takes to cool and the size of the crystals in the rock formed by the magma?



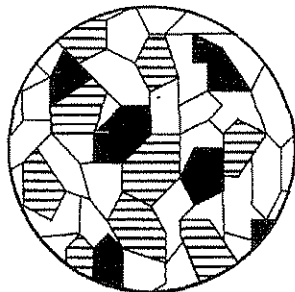
44. Olivine and pyroxene are commonly found in igneous rocks that are

- (1) felsic, with low density
- (2) felsic, with high density
- (3) mafic, with low density
- (4) mafic, with high density

45. According to the *Earth Science Reference Tables*, which statement is true of granite and gabbro?

- (1) are both intrusive
- (2) are both extrusive
- (3) have different grain sizes
- (4) both contain potassium feldspar

46. The diagram below shows the mineral composition of an igneous rock drawn actual size.



KEY TO MINERALS	
	PYROXENE
	PLAGIOCLASE FELDSPAR
	HORNBLLENDE

According to the *Earth Science Reference Tables*, this igneous rock is

- (1) gabbro
- (2) granite
- (3) basalt
- (4) rhyolite

47. Some nonsedimentary rocks are formed as a result of

- (1) solidification of molten material
- (2) evaporation and precipitation
- (3) cementation of particles
- (4) deposition of particles

48. A fine-grained igneous rock was probably formed by

- (1) weathering and erosion
- (2) great heat and pressure that did not produce melting
- (3) rapid cooling of molten material
- (4) burial and cementation of sediment

49. What is the main difference between metamorphic rocks and most other rocks?

- (1) Many metamorphic rocks contain only one mineral.
- (2) Many metamorphic rocks have an organic composition.
- (3) Many metamorphic rocks exhibit banding and distortion of structure.
- (4) Many metamorphic rocks contain a high amount of oxygen-silicon tetrahedra.

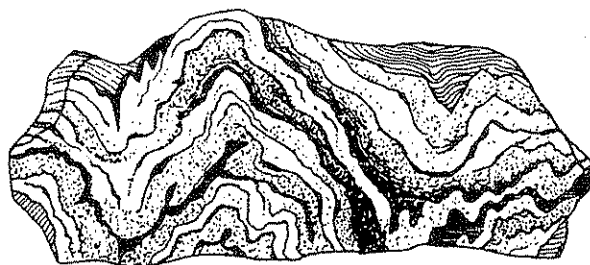
50. Metamorphic rocks result from the

- (1) erosion of rocks
- (2) recrystallization of rocks
- (3) cooling and solidification of molten magma
- (4) compression and cementation of soil particles

51. According to the *Earth Science Reference Tables*, which metamorphic rock will have visible mica crystals and a foliated texture?

- (1) marble
- (2) quartzite
- (3) schist
- (4) slate

52. The diagram below represents a rock with a distorted layer structure.



The distorted structure of this rock is most likely the result of

- (1) a long period of weathering
- (2) glacial activity
- (3) wind erosion
- (4) extreme pressure

53. Which processes change sedimentary rocks into metamorphic rocks?
- (1) erosion and deposition
  - (2) melting and solidification
  - (3) evaporation and condensation
  - (4) temperature and pressure changes
54. What is one difference between the metamorphic rocks quartzite and hornfels?
- (1) Hornfels is foliated; quartzite is nonfoliated.
  - (2) Hornfels contains plagioclase; quartzite does *not* contain plagioclase.
  - (3) Hornfels is produced by regional metamorphism; quartzite is produced by contact metamorphism.
  - (4) Hornfels is medium grained; quartzite is fine grained.
55. Which characteristic of rocks tends to increase as the rocks are metamorphosed?
- |              |                               |
|--------------|-------------------------------|
| (1) density  | (3) permeability              |
| (2) porosity | (4) number of fossils present |
56. Which characteristic provides the best evidence about the environment in which a rock was formed?
- |                           |                               |
|---------------------------|-------------------------------|
| (1) the color of the rock | (3) the texture of the rock   |
| (2) the size of the rock  | (4) the thickness of the rock |
57. The grouping of rocks as igneous, sedimentary, and metamorphic is based primarily upon differences in
- |            |              |
|------------|--------------|
| (1) age    | (3) size     |
| (2) origin | (4) hardness |
58. The main difference between sedimentary and nonsedimentary rocks is the
- (1) means by which they are located
  - (2) conditions under which they are formed
  - (3) minerals of which they are composed
  - (4) locations in which they are found
59. Rocks are classified on the basis of
- (1) the mass of the sample
  - (2) the shape of the sample
  - (3) their age in millions of years
  - (4) how they were formed
60. Base your answer to the following question on the *Earth Science Reference Tables*.

The end product of the weathering of gabbro or basalt rocks is a solution of dissolved material that most likely would contain high amounts of

- |                             |                            |
|-----------------------------|----------------------------|
| (1) iron and magnesium      | (3) aluminum and iron      |
| (2) magnesium and potassium | (4) aluminum and potassium |

61. How do the metamorphic rocks schist and quartzite differ?
- (1) Quartzite contains the mineral quartz and schist does not.
  - (2) Quartzite forms from regional metamorphism and schist does not.
  - (3) Schist is organically formed and quartzite is not.
  - (4) Schist is foliated and quartzite is not.
62. Which characteristic provides the best evidence that obsidian rock formed in an extrusive environment?
- (1) layers of rounded fragments
  - (2) distorted bands of large mineral crystals
  - (3) noncrystalline glassy texture
  - (4) mineral cement between grains
63. As the depth within the Earth's crust increases, the amount of sedimentary rock, compared to the amount of nonsedimentary rock, will generally
- |              |                     |
|--------------|---------------------|
| (1) decrease | (3) remain the same |
| (2) increase |                     |
64. Which rocks form relatively thin layers, compared to the thickness of the continent, over large areas of the continents?
- |                         |                             |
|-------------------------|-----------------------------|
| (1) granite and gabbro  | (3) metamorphic rocks       |
| (2) sandstone and shale | (4) intrusive igneous rocks |
65. In which part of the Earth are felsic rocks most likely to be found?
- |                       |                    |
|-----------------------|--------------------|
| (1) continental crust | (3) plastic mantle |
| (2) oceanic crust     | (4) rigid mantle   |
66. Which rocks would most likely be separated by a transition zone of altered rock (metamorphic rock)?
- |                             |                                |
|-----------------------------|--------------------------------|
| (1) sandstone and limestone | (3) shale and sandstone        |
| (2) granite and limestone   | (4) conglomerate and siltstone |
67. Heat and pressure due to magma intrusions may result in
- |                      |                          |
|----------------------|--------------------------|
| (1) vertical sorting | (3) contact metamorphism |
| (2) graded bedding   | (4) chemical evaporites  |
68. According to the *Earth Science Reference Tables*, igneous rocks may form by
- (1) deposition and compression
  - (2) evaporation and precipitation
  - (3) melting and solidification
  - (4) heat and pressure
69. Which rock is composed of materials that show the greatest variety of rock origins?
- (1) a limestone composed of coral fragments cemented together by calcium carbonate
  - (2) a conglomerate composed of pebbles of granite, siltstone, and basalt
  - (3) a very fine-grained basalt with sharp edges
  - (4) a sandstone composed of rounded grains of quartz

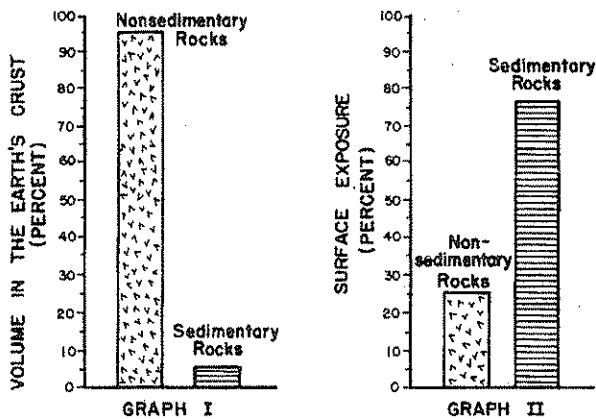
70. According to the Rock Cycle diagram in the *Earth Science Reference Tables*, which type(s) of rock can be the source of deposited sediments?

- (1) igneous and metamorphic rocks, only
- (2) metamorphic and sedimentary rocks, only
- (3) sedimentary rocks, only
- (4) igneous, metamorphic, and sedimentary rocks

71. Which mineral can be found in granite, andesite, gneiss, and hornfels?

- (1) quartz
- (2) pyroxene
- (3) olivine
- (4) biotite mica

Base your answers to questions 72 through 76 on the *Earth Science Reference Tables* and the two graphs below. Graph I represents the percentage of sedimentary and nonsedimentary rock which makes up the Earth's crust by volume. Graph II represents, of those rocks that are exposed at the surface (outcrops), the percentage that are sedimentary rocks and nonsedimentary rocks.



72. Approximately what percentage of the Earth's crust is composed of sedimentary rock?

- (1) 5%
- (2) 25%
- (3) 75%
- (4) 95%

73. Which is the most abundant element present in the rocks shown in graph I?

- (1) nitrogen
- (2) oxygen
- (3) silicon
- (4) hydrogen

74. All of the rocks represented in graph I must contain

- (1) fossils
- (2) intergrown crystals
- (3) sediments
- (4) minerals

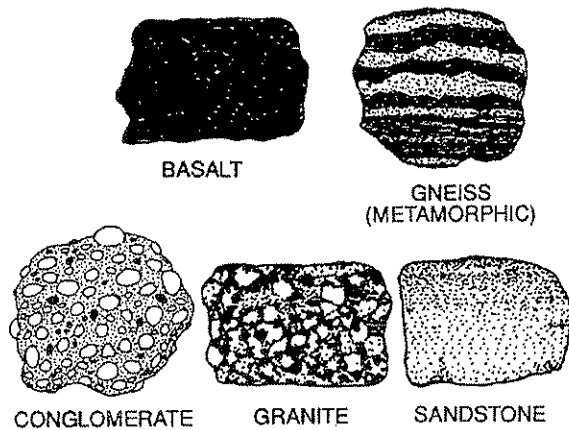
75. Most sedimentary rock has been formed by which two processes?

- (1) uplifting and melting
- (2) extrusion and intrusion
- (3) compaction and cementation
- (4) faulting and folding

76. Which statement is best supported by the data shown in the graphs?

- (1) The crust of the Earth is composed mostly of sedimentary rocks.
- (2) Rock outcrops on the Earth's surface are chiefly of the nonsedimentary type.
- (3) Most nonsedimentary rocks are composed of the melted remains of sedimentary rocks.
- (4) Most sedimentary rock is found at or near the surface of the Earth.

Base your answers to questions 77 through 81 on the *Earth Science Reference Tables* and the diagrams below of five rock samples.



77. Which sample is composed of sediments 0.006 centimeter to 0.2 centimeter in size that were compacted and cemented together?

- (1) conglomerate
- (2) sandstone
- (3) gneiss
- (4) granite

78. If granite were subjected to intense heat and pressure, it would most likely change to

- (1) conglomerate
- (2) sandstone
- (3) gneiss
- (4) basalt

79. The basalt was most likely formed by

- (1) heat and pressure
- (2) melting and solidification
- (3) compaction and cementation
- (4) erosion and deposition

80. Which sample would most likely contain fossils?

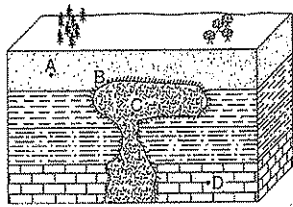
- (1) gneiss
- (2) granite
- (3) sandstone
- (4) basalt

81. Which sample is igneous and has a coarse texture?

- (1) sandstone
- (2) conglomerate
- (3) basalt
- (4) granite



Base your answers to questions 82 through 86 on the *Earth Science Reference Tables* and the diagram below. The diagram represents a cross section of a portion of the Earth's crust. Points A through D represent locations in the bedrock. The rock layers have not been overturned.

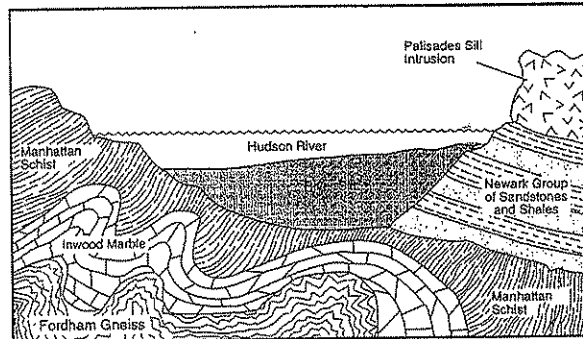


KEY	
	Limestone
	Shale
	Siltstone
	Sandstone
	Igneous intrusion (gabbro)
	Contact metamorphism

82. Which rock is *least* likely to contain fossils?
- (1) gabbro (3) limestone  
(2) shale (4) siltstone
83. Which rock formed most recently?
- (1) limestone (3) shale  
(2) siltstone (4) gabbro
84. Which rock formed as a result of heat and pressure at point B?
- (1) slate (3) marble  
(2) quartzite (4) anthracite coal
85. The limestone layer could have been formed primarily by
- (1) foliation of mica during faulting  
(2) chemical precipitation of calcite  
(3) deposition of quartz fragments  
(4) decomposition of plant remains
86. Which two minerals will probably be most abundant in the igneous intrusion?
- (1) quartz and calcite  
(2) halite and gypsum  
(3) potassium feldspar and biotite  
(4) plagioclase feldspar and pyroxene

Base your answers to questions 87 through 89 on the cross section below. The cross section shows the surface and subsurface rock formations near New York City.

Geologic Section Across the Hudson River

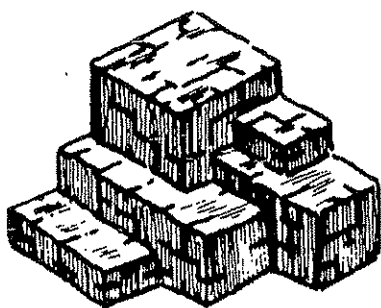


(Not drawn to scale)

87. The portion of the Palisades sill that contains large crystals of plagioclase feldspar and pyroxene is considered to be similar in texture and composition to
- (1) obsidian (3) basalt glass  
(2) granite (4) gabbro
88. Which rock formation was originally limestone?
- (1) Palisades sill (3) Inwood marble  
(2) Fordham gneiss (4) Manhattan schist
89. The rock types shown on the left side of this geologic cross section were mainly the result of
- (1) heat and pressure exerted on previously existing rock  
(2) melting and solidification of crustal rocks at great depths  
(3) tectonic plate boundaries diverging at the mid-ocean ridge  
(4) compaction and cementation of sediments under ocean waters

Base your answers to questions 90 through 94 on the *Earth Science Reference Tables* and the diagram and table below.

Mineral Sample A



Mass = 210 grams

Mineral Density Table

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

90. If the volume of mineral sample *A* is 28 cubic centimeters, sample *A* is most likely
- (1) copper (3) chalcopyrite  
(2) galena (4) dolomite
91. 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?
- (1) hardness (3) cleavage  
(2) luster (4) streak
92. 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
- (1) heated and expanded  
(2) cooled and contracted  
(3) soaked in water  
(4) dropped and a piece was lost

93. Under identical conditions, several samples of the mineral pyrite are measured, and their densities are compared. The values obtained should show that

- (1) rounded samples are more dense than rough samples  
(2) large samples are more dense than small samples  
(3) small samples are more dense than large samples  
(4) all the pyrite samples have the same density

94. When a sample of the mineral calcite is heated, it expands, causing its density to be

- (1) less than 2.7 g/cm<sup>3</sup> (3) between 2.7 and 3.0 g/cm<sup>3</sup>  
(2) exactly 2.7 g/cm<sup>3</sup> (4) greater than 3.0 g/cm<sup>3</sup>

Base your answers to questions 95 through 98 on the *Earth Science Reference Tables*, the data table below and your knowledge of Earth science.

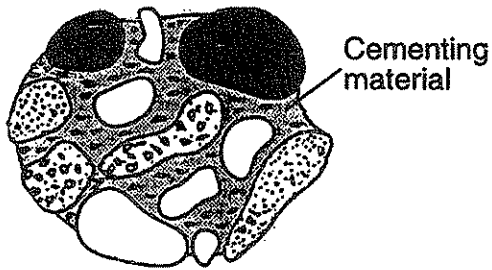
### MINERAL HARDNESS

Moh's Hardness Scale	Approximate Hardness of Common Objects	
Talc	1	
Gypsum	2	Fingernail (2.5)
Calcite	3	Copper penny (3.5)
Fluorite	4	Iron nail (4.5)
Apatite	5	Glass (5.5)
Feldspar	6	Steel file (6.5)
Quartz	7	Streak plate (7.0)
Topaz	8	
Corundum	9	
Diamond	10	

95. Moh's scale arranges minerals according to their relative
- (1) resistance to breaking (3) specific heat  
(2) resistance to scratching (4) specific gravity
96. Which statement is best supported by the data shown?
- (1) An iron nail contains fluorite.  
(2) A streak plate is composed of quartz.  
(3) Topaz is harder than a steel file.  
(4) Apatite is softer than a copper penny.
97. The durable gemstones ruby and sapphire are valuable due to their color and hardness. These gemstones would most likely be located on Moh's scale at the hardness level of
- (1) 1 (3) 3  
(2) 9 (4) 4

- 
98. Moh's scale would be most useful for
- (1) finding the mass of a mineral sample
  - (2) finding the density of a mineral sample
  - (3) identifying a mineral sample
  - (4) counting the number of cleavage surfaces of a mineral sample
- 

Base your answers to questions 99 and 100 on the rock sample shown below.



( Actual size )

99. The rounded pebbles of this rock have been cemented together to form
- (1) granite, an igneous rock
  - (2) conglomerate, a sedimentary rock
  - (3) siltstone, a sedimentary rock
  - (4) Weiss, a metamorphic rock
100. The average size of the pebbles in the sample is approximately
- |            |             |
|------------|-------------|
| (1) 1.2 cm | (3) 6.4 cm  |
| (2) 0.2 cm | (4) 13.2 cm |
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