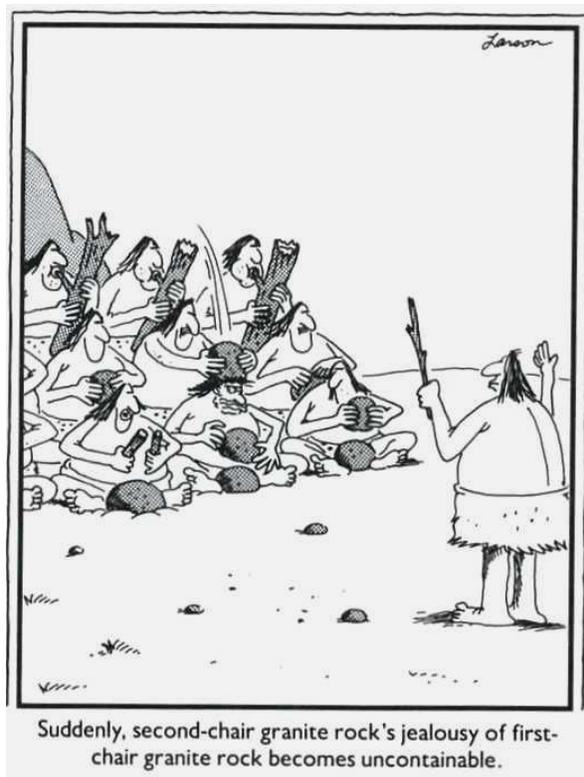
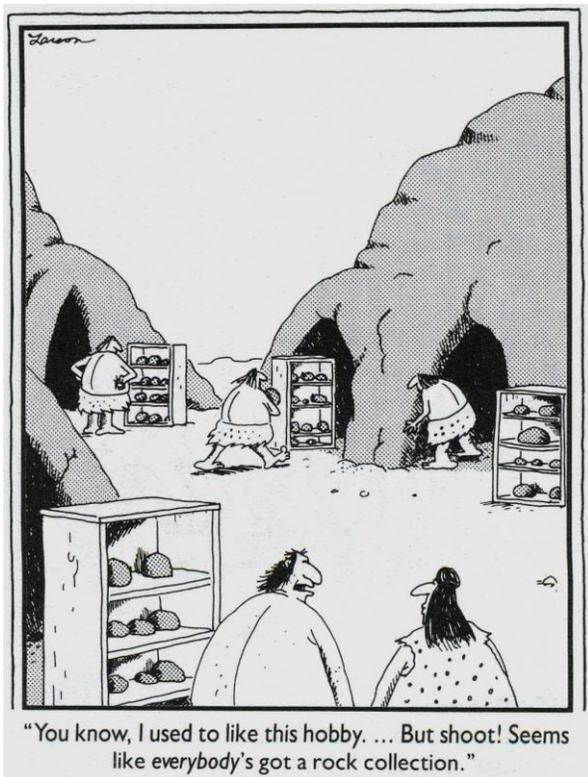


Minerals and Rocks Packet



Total points = $\frac{\quad}{315}$

Define the Following terms:

Minerals- [1]

Inorganic- [1]

Luster- [1]

Hardness- [1]

Streak- [1]

Cleavage- [1]

Specific gravity-[1]

Rocks- [1]

Igneous Rocks- [1]

Felsic- [1]

Mafic- [1]

Sedimentary Rocks- [1]

Metamorphic Rocks- [1]

Banding- [1]

MINERALS SECTION

Directions: Based on your knowledge of earth science and page 16 of your ESRT's, please answer the following questions on this page.

Properties of Common Minerals

1. What are the two different types of luster? [2]
2. What is the range of hardness found on the chart? [2]
3. What type of breakage is more common: cleavage or fracture? [1]
4. What is the most common element found in the composition of minerals? [1]
5. For the mineral **quartz**, identify the following: [5]
Luster: _____ Hardness: _____ Breakage: _____ Color: _____ Composition: _____
6. For the mineral **galena**, identify the following: [5]
Luster: _____ Hardness: _____ Breakage: _____ Color: _____ Composition: _____
7. For the mineral **olivine**, identify the following: [5]
Luster: _____ Hardness: _____ Breakage: _____ Color: _____ Composition: _____
8. For the mineral **fluorite**, identify the following: [5]
Luster: _____ Hardness: _____ Breakage: _____ Color: _____ Composition: _____
9. Which minerals can scratch glass, has a non-metallic luster, has fracture and is a dark red color? [1]
10. Which mineral can be easily scratched by a finger nail, has cleavage, a metallic luster and has a black streak? [1]

Directions: Answer questions 1-14 on the next two pages regarding minerals:

The table below shows the physical properties of nine minerals. Use this data to answer questions 1-4.

Mineral	Color	Luster	Streak	Hardness	Density (g/mL)	Chemical Composition
biotite mica	black	glassy	white	soft	2.8	$K(Mg,Fe)_3(AlSi_3O_{10})(OH)_2$
diamond	varies	glassy	colorless	hard	3.5	C
galena	gray	metallic	gray-black	soft	7.5	PbS
graphite	black	dull	black	soft	2.3	C
kaolinite	white	earthy	white	soft	2.6	$Al_2(Si_2O_5)(OH)_4$
magnetite	black	metallic	black	hard	5.2	Fe_3O_4
olivine	green	glassy	white	hard	3.4	$(Fe,Mg)_2SiO_4$
pyrite	brass yellow	metallic	greenish-black	hard	5.0	FeS_2
quartz	varies	glassy	colorless	hard	2.7	SiO_2

1.) Which mineral has a different color in its powdered form than in its original form? [1]

1. pyrite
2. graphite
3. kaolinite
4. magnetite

2.) Which mineral contains iron, has a metallic luster, is hard, and has the same color and streak? [1]

1. biotite mica
2. galena
3. kaolinite
4. magnetite

3.) Why do diamond and graphite have different physical properties, even though they are both composed entirely of the element carbon? [1]

1. Only diamond contains radioactive carbon.
2. Only graphite consists of organic material.
3. The minerals have different arrangements of carbon atoms.
4. The minerals have undergone different amounts of weathering.

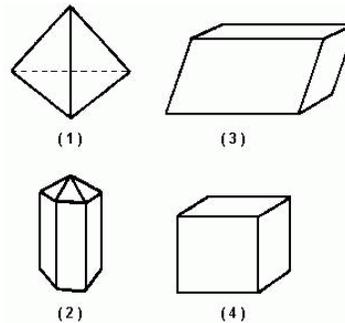
4.) The data table shows the composition of six common rock-forming minerals. The data table provides evidence that: [1]

1. the same elements are found in all minerals
2. a few elements are found in many minerals
3. all elements are found in only a few minerals
4. all elements are found in all minerals

5.) Quartz mineral samples are best identified by their: [1]

1. hardness
2. color
3. size
4. mass

6.) Which diagram best represents the model of a silicon-oxygen tetrahedron? [1]



7.) Which common mineral fizzes when dilute hydrochloric acid (HCl) is placed on it? [1]

1. calcite
2. feldspar
3. quartz
4. talc

8.) Amphiboles and pyroxenes are both silicate minerals that form with the silicon-oxygen tetrahedra in chains. One way in which the minerals can be distinguished from each other is by: [1]

1. Pyroxene's black to dark green color
2. Both minerals can have a hardness of 5.5.
3. Pyroxene has fracture while amphibole has cleavage
4. Pyroxenes have cleavage is in two directions at right angles and amphiboles have cleavage in two directions at 56° and 124° .

9.) A human fingernail has a hardness of approximately 2.5. Which two minerals are *softer* than a human fingernail? [1]

1. calcite and halite
2. sulfur and fluorite
3. graphite and talc
4. pyrite and magnetite

10.) The mineral graphite is often used as: [1]

1. a lubricant
2. an abrasive
3. a source of iron
4. a cementing material

11.) Different arrangements of tetrahedra in the silicate group of minerals result in differences in the minerals': [1]

1. age, density, and smoothness
2. cleavage, color, and abundance
3. hardness, cleavage, and crystal shape
4. chemical composition, size, and origin

12.) Which of the following minerals is the most resistant to being scratched? [1]

1. Hematite
2. Calcite
3. Orthoclase
4. Garnet

13.) Which home-building material is made mostly from the mineral gypsum? [1]

1. plastic pipes
2. window glass
3. drywall panels
4. iron nails

14.) How are the minerals biotite mica and muscovite mica different? [1]

1. Biotite mica is colorless, but muscovite mica is not.
2. Biotite mica contains iron and/or magnesium, but muscovite mica does not.
3. Muscovite mica scratches quartz, but biotite mica does not.
4. Muscovite mica cleaves into thin sheets, but biotite mica does not.

IGNEOUS ROCKS SECTION

IGNEOUS ROCKS REVIEW

Directions: Using your *Igneous Rock Identification Scheme* from your ESRT's answer the following questions.

Note: An important key to classifying igneous rocks is their *Environment of Formation*. In other words, where did the rock originally solidified; from magma or lava.

1. What are the names of the 2 major classification groups for igneous rocks that are based on where the rock formed? Include the alternate name (in parenthesis) for each. [2]

_____ and _____

2. Is Granite intrusive or extrusive? _____ [1]

3. Is Basalt intrusive or extrusive? _____ [1]

a. Is Obsidian intrusive or extrusive? _____ [1]

b. What is Obsidian's texture? _____ [1]

Note: Cooling history of an igneous rock (i.e. the time it takes for the rock to solidify from magma or lava), determines the size of the crystals (minerals) in the rock.

- Rocks that cool underground cool more slowly and have larger crystals.
- Rocks that cool above ground cool more quickly and have smaller crystals or no visible crystals.

Look at the *Grain Size* and *Texture* columns in the Igneous Rock Identification Scheme (pg. 6) in the ESRT's.

4. a. Which igneous rocks tend to be coarser in texture, with larger mineral crystals...*intrusive* or *extrusive* rocks? _____ [1]

b. What then can be said of intrusive Igneous Rocks as to whether they formed below or above Earth's surface?

_____ [1]

c. What then can be said of extrusive Igneous Rocks as to whether they formed below or above Earth's surface?

_____ [1]

5. Can Gabbro contain the mineral Quartz? _____ [1]

6. Can Granite contain the mineral Olivine? _____ [1]

7. Name 2 intrusive rocks containing Potassium Feldspar and Quartz?

_____ and _____ [2]

8. Name 2 intrusive rocks containing Pyroxene and Olivine?

_____ and _____ [2]

9. What is the grain size of each of the following igneous rocks?

Andesite: _____ [1]

Gabbro: _____ [1]

Granite: _____ [1]

Rhyolite: _____ [1]

Obsidian: _____ [1]

Pumice: _____ [1]

10. a. Name one intrusive rock with a light color? _____ [1]

b. Is the rock felsic or mafic? _____ [1]

11. a. Name one extrusive rock with a dark color? _____ [1]

b. Is the rock felsic or mafic? _____ [1]

12. Explain the relationship that exists between felsic rocks and their overall color.

_____ [1]

13. Explain the relationship that exists between mafic rocks and their overall density.

_____ [1]

14. Which intrusive rock has the *highest* density? _____ [1]

15. Name an extrusive rock that has a low density? _____ [1]

16. Name a rock which formed deep in the Earth that is composed of:

30% Quartz, 35% Orthoclase Feldspar, 25% Plagioclase Feldspar, 5% Biotite Mica and 5% Amphibole (Hornblende). Percentages are approximate and variable.

Rock Name: _____ [1]

17. Name a rock which formed on Earth's surface that is composed of:

15% Olivine, 20% Pyroxene, 45% Plagioclase Feldspar, 5% Biotite Mica and 15% Amphibole (Hornblende). Percentages are approximate and variable.

Rock Name: _____ [1]

18. Name a fine-grained rock with: no Potassium Feldspar (Orthoclase) and no Olivine.

Rock Name: _____ [1]

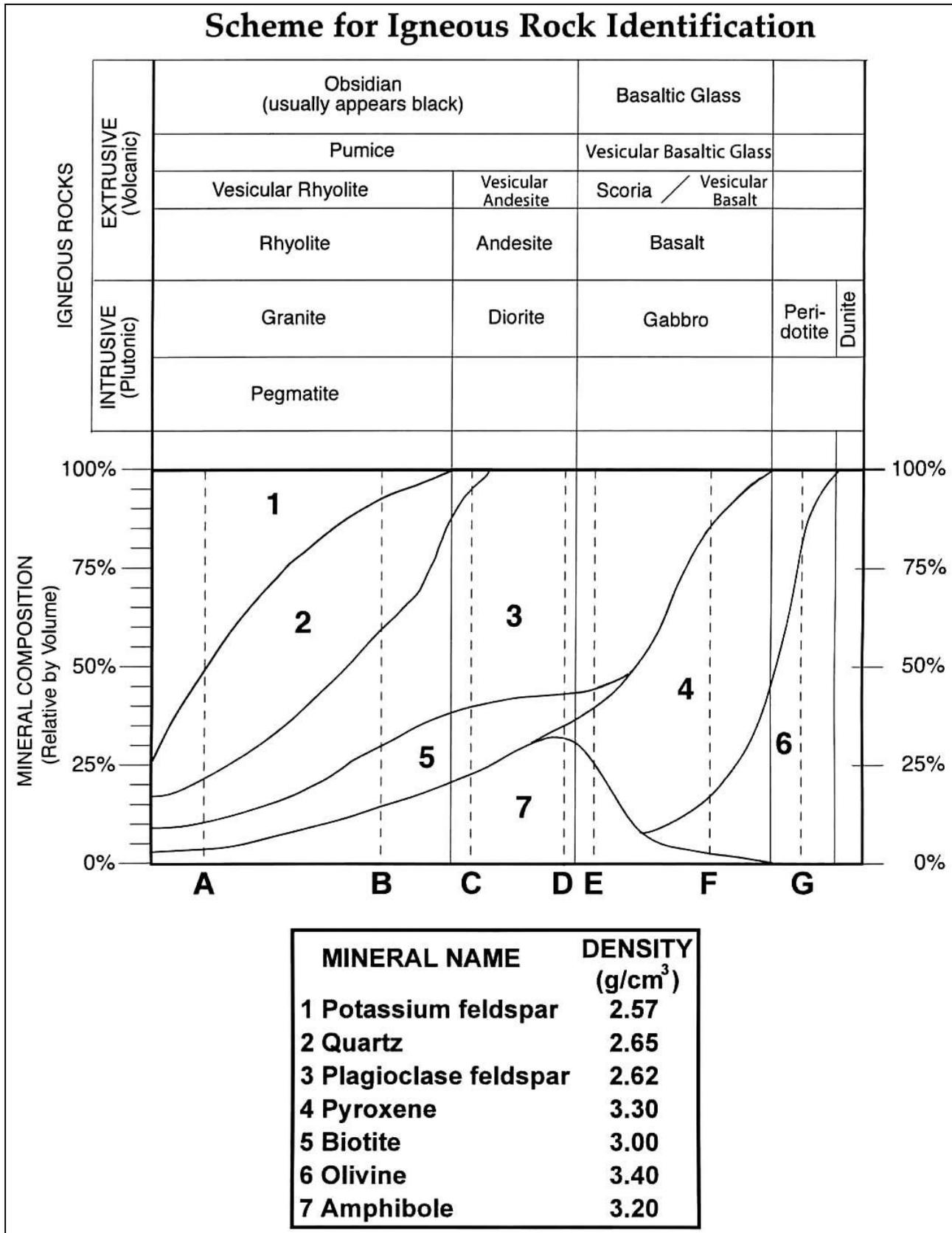
19. a. Name a vesicular rock. _____ [1]

b. Where did it form? _____ [1]

c. What caused the vesicles (holes) to form in this rock?

_____ [2]

Directions: Using the modified *Scheme for Igneous Rock Identification* below to calculate the density of each selected rock on the data tables on the following pages.



ROCK A: Granite	Percentage	Density	Percentage x Density
Amphibole		3.20	
Biotite		3.00	
Olivine		3.40	
Plagioclase feldspar		2.62	
Potassium feldspar		2.57	
Pyroxene		3.30	
Quartz		2.65	
SUM:			

ROCK B: Granite	Percentage	Density	Percentage x Density
Amphibole		3.20	
Biotite		3.00	
Olivine		3.40	
Plagioclase feldspar		2.62	
Potassium feldspar		2.57	
Pyroxene		3.30	
Quartz		2.65	
SUM:			

ROCK C: Diorite	Percentage	Density	Percentage x Density
Amphibole		3.20	
Biotite		3.00	
Olivine		3.40	
Plagioclase feldspar		2.62	
Potassium feldspar		2.57	
Pyroxene		3.30	
Quartz		2.65	
SUM:			

ROCK D: Diorite	Percentage	Density	Percentage x Density
Amphibole		3.20	
Biotite		3.00	
Olivine		3.40	
Plagioclase feldspar		2.62	
Potassium feldspar		2.57	
Pyroxene		3.30	
Quartz		2.65	
SUM:			

[32]

ROCK E: Gabbro	Percentage	Density	Percentage x Density
Amphibole		3.20	
Biotite		3.00	
Olivine		3.40	
Plagioclase feldspar		2.62	
Potassium feldspar		2.57	
Pyroxene		3.30	
Quartz		2.65	
SUM:			

ROCK F: Gabbro	Percentage	Density	Percentage x Density
Amphibole		3.20	
Biotite		3.00	
Olivine		3.40	
Plagioclase feldspar		2.62	
Potassium feldspar		2.57	
Pyroxene		3.30	
Quartz		2.65	
SUM:			

ROCK G: Peridotite	Percentage	Density	Percentage x Density
Amphibole		3.20	
Biotite		3.00	
Olivine		3.40	
Plagioclase feldspar		2.62	
Potassium feldspar		2.57	
Pyroxene		3.30	
Quartz		2.65	
SUM:			

[24]

SEDIMENTARY ROCKS SECTION

Directions: Using your *Sedimentary Rock Identification Scheme* from your ESRT's answer the following questions.

1. What are the two major groups of sedimentary rocks? _____ and _____. [2]
2. Which of these 2 groups is broken down into smaller groups by grain size?
_____ [1]
3. Which of these 2 groups is broken into smaller groups by composition?
_____ [1]
4. Two clastic textured rocks have mixed size pieces from clay to boulders. Which has rounded fragments?
_____ [1]
5. Which clastic rock is made of clay? _____ [1]
6. Which rock's map symbol looks like sand? _____ [1]
7. What is the grain size range of siltstone? _____ [1]
8. What size particles which make up shale? _____ [1]
9. What does **composition** mean? _____ [1]
10. What mineral is rock salt composed of? _____ [1]
11. What mineral is limestone composed of? _____ [1]
12. What element comprises coal? _____ [1]
13. What makes coal's composition different from that of all the other sedimentary rocks?
_____ [1]
14. What four rocks form from chemical precipitates and evaporites? _____,
_____, _____ and _____. [4]
15. What rock has a map symbol that looks like graph paper? (This is its crystal form.) _____ [1]
16. Draw the map symbol for limestone here.

--

 [2]
17. Which of the following is *not* a sedimentary rock? (A) gypsum (B) shale (C) conglomerate (D) marble [1]
18. Which of the following is *not* chemically or organically formed? (A) limestone (B) coal (C) siltstone (D) rock salt [1]

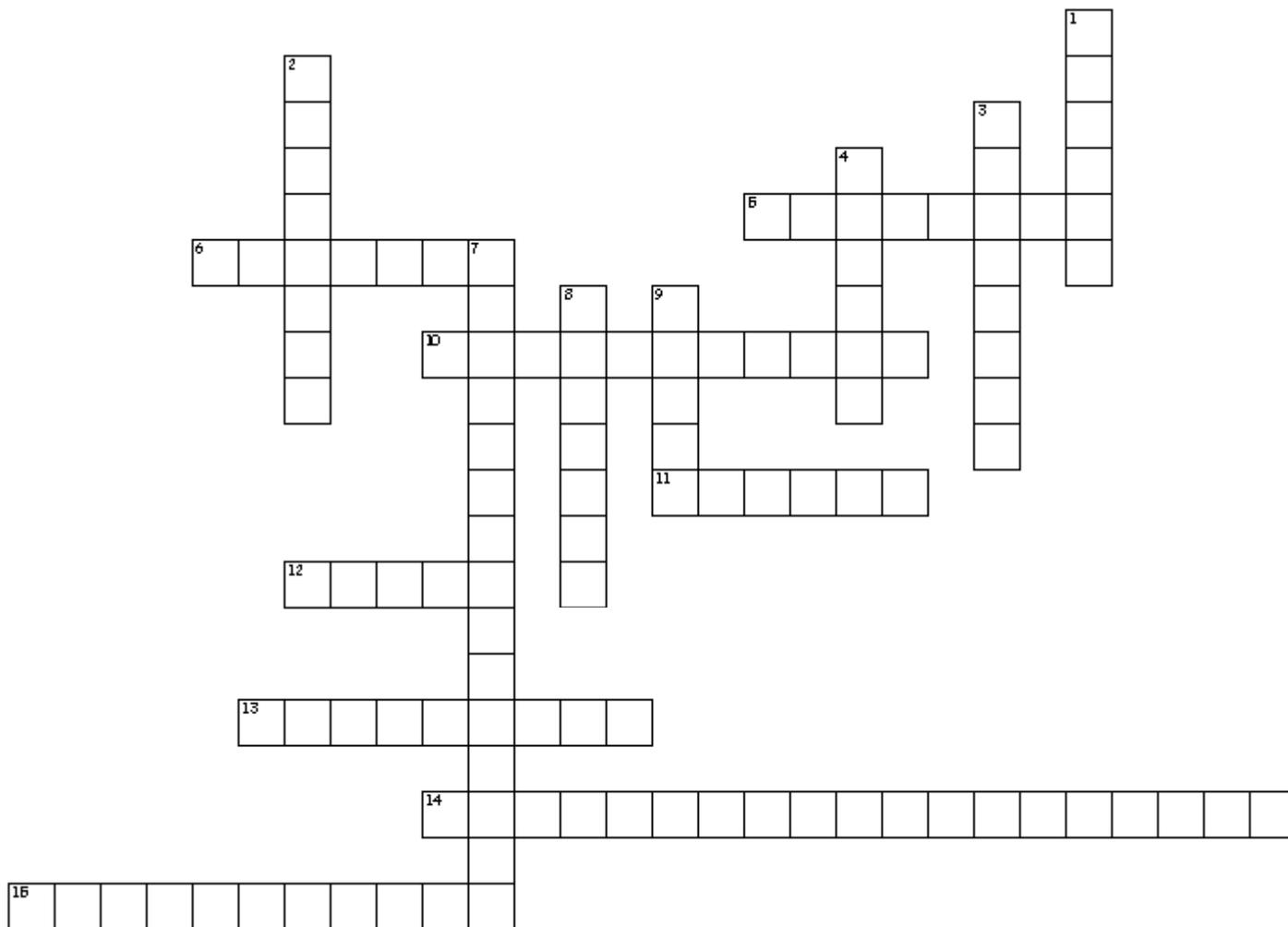
METAMORPHIC ROCKS SECTION

Directions: Using your *Metamorphic Rock Identification Scheme* from your ESRT's answer the following questions.

1. Determine the name of a metamorphic rock that is foliated, HAD some mica which has changed into feldspar, and has medium to coarse grain size _____. [1]
2. There is one metamorphic rock with variable composition, it is nonfoliated and forms from contact metamorphism, it is _____. [1]
3. Part of its name comes from a sedimentary rock formed from glacier deposits; it is formed by regional or contact metamorphism. This rock is _____. [1]
4. Another metamorphic rock with composition similar to a mineral AND a bioclastic sedimentary rock, also bubbles with acid, and is non foliated. Name it: _____. [1]
5. This silicate based metamorphic rock is non-foliated with fine to coarse grain size. It is known as: _____. [1]
6. A foliated rock showing mineral alignment and formed from regional metamorphism. It can contain mica, feldspar, quartz, garnet and amphibole. The ESRT's names it: _____ [1]
7. With a fine grain size, it has undergone regional metamorphism; it can split easily into flat surfaces partly due to its mica content. You should call it: _____. [1]
8. All metamorphic rocks are formed by one of two general types of metamorphism, these are _____ and _____ [2]
9. This rock shows a kind of foliation described as 'mineral alignment' and does not contain pyroxene. _____ [1]
10. How does contact metamorphism change rocks? _____ [2]
11. This metamorphic rock can have various mineral particles in it, and does have a coarse grain size with particles in a matrix. It is also called _____ [1]
12. One particular specimen starts as a clastic sedimentary rock with a grain size of 0.04 cm called _____. [1] It undergoes metamorphosis to become _____. [1]
13. Name 5 minerals that can be found in *schist* [5]
 - a. _____
 - b. _____
 - c. _____
 - d. _____
 - e. _____
14. What other metamorphic rock also has the above 5 minerals in it? _____ [1]
15. Is there a metamorphic rock that is foliated, has a fine texture, composed mainly of mica and is formed from contact metamorphism? Yes or No (circle answer) [1]
16. Metamorphic rock texture is described by two major characteristics. Metamorphic rocks are either _____ or _____. [2]
17. Provide the latitude and longitude of one location in New York state where you can find metamorphic rocks. Give your answer to the closest minute (remember there are 60' in 1°). Don't forget to put directions (N, S, E, or W) on your answer. _____ latitude _____ longitude [1]
18. Write the name of each metamorphic rock type below its map symbol. [6]

Rocks and Minerals Crossword Puzzle

Directions: Using the clues below, complete the crossword puzzle. [15]



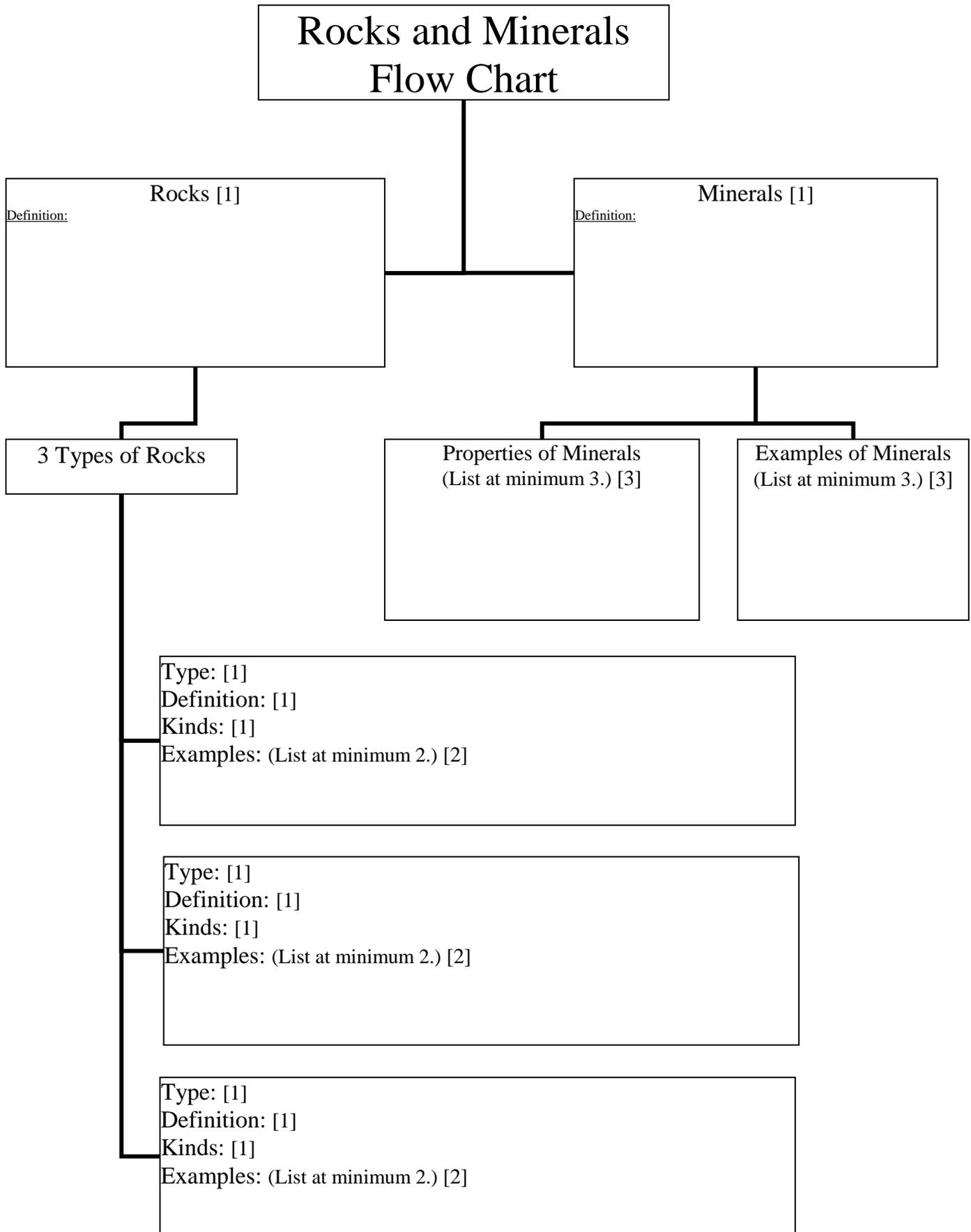
Across

5. If a mineral breaks readily along flat surfaces it shows:
6. _____ rocks form when molten rock, known as magma (or lava, when it reaches the surface), cools and solidifies.
10. _____ rocks are formed when existing rocks are changed by heat and/or pressure, usually at a great depth.
11. The powder form of the mineral.
12. An acronym for rocks containing magnesium and iron.
13. A substance not formed by or from living things.
14. Has 1 silicon atom surrounded by 4 oxygen atoms.
15. _____ rocks are the result of the weathering process on earth.

Down

1. Describing the way light is reflected from the freshly cut surface of a mineral.
2. The ability of a mineral to resist scratching.
3. If a mineral DOESN'T break in a particular direction, it shows:
4. An acronym for rocks containing feldspar and silica.
7. The ratio of the density of a mineral's density to the density of water.
8. This occurs when minerals of different densities recrystallize under pressure and separate into layers.
9. A natural piece of the solid Earth; usually composed of one or more minerals.

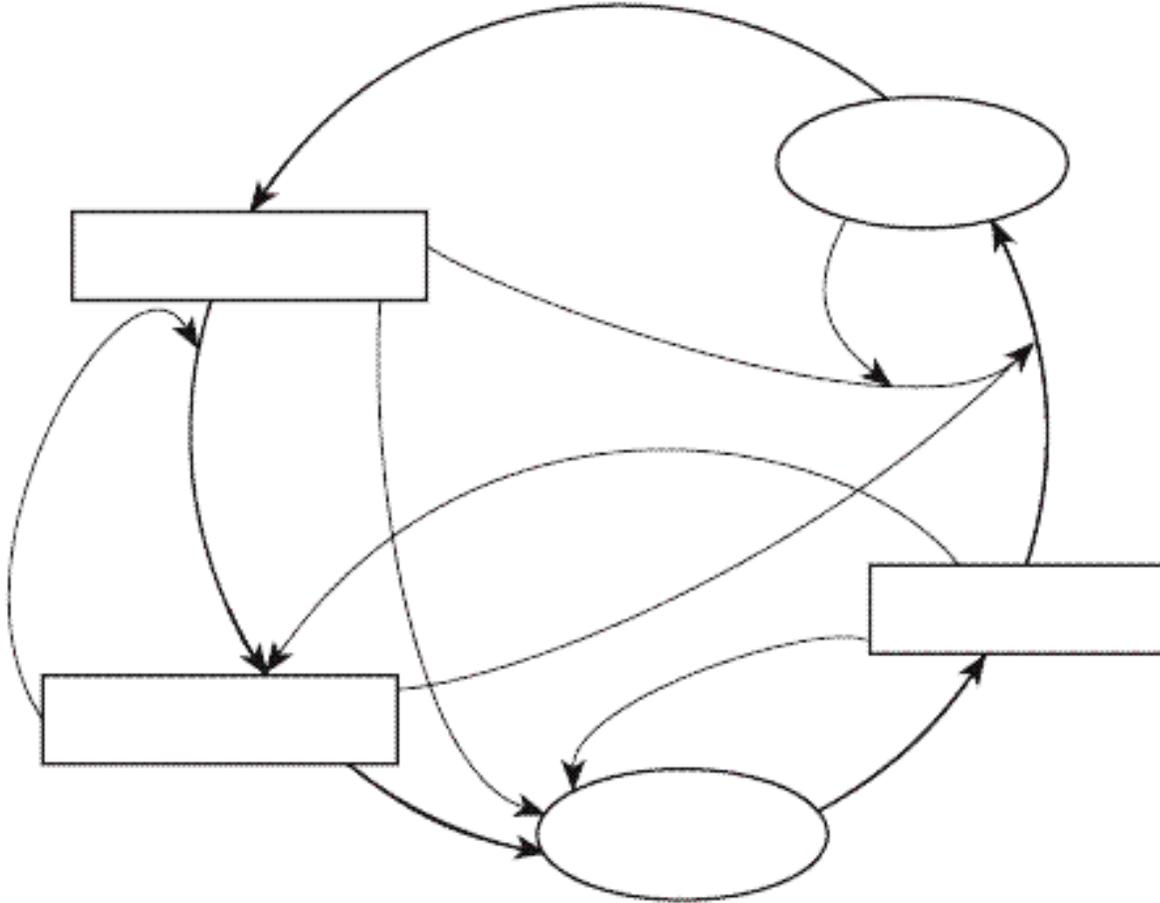
Directions: Using your knowledge of Earth Science, complete the flow chart below.



The Rock Cycle

Directions: Using your *Rock Cycle in Earth's Crust Diagram* from your ESRT's, COMPLETELY fill in the blank diagram below, and answer the following questions. [30]

The Rock Cycle



<p>1. Rocks are classified as igneous, sedimentary, or metamorphic based primarily on their: [1]</p> <ol style="list-style-type: none"> 1. texture 2. crystal or grain size 3. method of formation 4. mineral composition 	<p>3. Some nonsedimentary rocks are formed as a result of: [1]</p> <ol style="list-style-type: none"> 1. solidification of molten material 2. evaporation and precipitation 3. cementation of particles 4. deposition of particles
<p>2. When granite melts and then solidifies, it becomes: [1]</p> <ol style="list-style-type: none"> 1. a sedimentary rock 2. an igneous rock 3. a metamorphic rock 4. sediments 	<p>4. Which statement is best supported by the information provided in the reference diagram of the <i>Rock Cycle in Earth's Crust</i>? [1]</p> <ol style="list-style-type: none"> 1. Igneous rocks are formed from eroded sediments of metamorphic rocks. 2. Sedimentary rocks are composed of intergrown crystals. 3. Metamorphic rocks are formed by the complete melting of any other rock. 4. Rocks may be formed from other rocks by various processes.

Regents Rock Questions

Directions: Using your ESRT's and your knowledge of Earth Science, answer all the questions on *rocks* below.

Igneous Rocks

1.) Which relative concentrations of elements are found in felsic rock? [1]

1. a high concentration of aluminum and a low concentration of iron
2. a high concentration of iron and a low concentration of aluminum
3. a high concentration of magnesium and a low concentration of iron
4. a high concentration of magnesium and a low concentrate of aluminum

2.) Rhyolite is an example of a [1]

1. monomineralic igneous rock
2. polymineralic igneous rock
3. monomineralic sedimentary rock
4. polymineralic sedimentary rock

3.) The diagrams to the right represent four rock samples. Which rock took the longest time to solidify from magma deep within the Earth? [1]

4.) The size of the mineral crystals found in an igneous rock is directly related to the [1]

1. density of the minerals
2. color of the minerals
3. cooling time of the molten rock
4. amount of sediments cemented together

5.) A fine-grained igneous rock contains 11% plagioclase, 72% pyroxene, 15% olivine, and 2% amphibole. This rock would be classified as [1]

1. granite
2. rhyolite
3. gabbro
4. basalt

6.) The best evidence for determining the cooling rate of an igneous rock during its solidification is provided by [1]

1. index fossils
2. faults in the rock
3. the crystal size of its minerals
4. the disintegration of radioactive substances



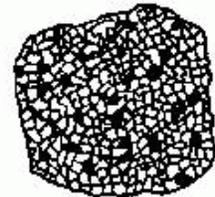
Bands of alternating light and dark minerals
(1)



Glassy black rock that breaks with a shell-shape fracture
(3)



Easily split layers of 0.0001-cm diameter particles cemented together
(2)

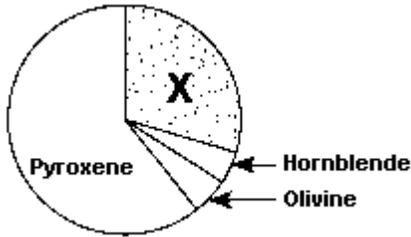


Interlocking 0.5-cm diameter crystals of various colors
(4)

7.) An igneous rock contains large mineral crystals. The best conclusion to make about this rock is that it [1]

1. contains plagioclase and pyroxene
2. is felsic and has a low density
3. once contained small crystal which eroded
4. cooled slowly as it formed

8.) The graph represents the percentage of each mineral found in a sample of igneous rock. [1]



Which mineral is represented by the letter X in the graph? [1]

1. potassium feldspar
2. plagioclase feldspar
3. quartz
4. biotite

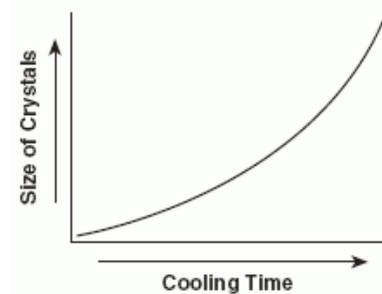
9.) Base your answer on the map below of Iceland, a country located on the Mid-Atlantic Ridge. Four locations are represented by the letters A through D. [1]



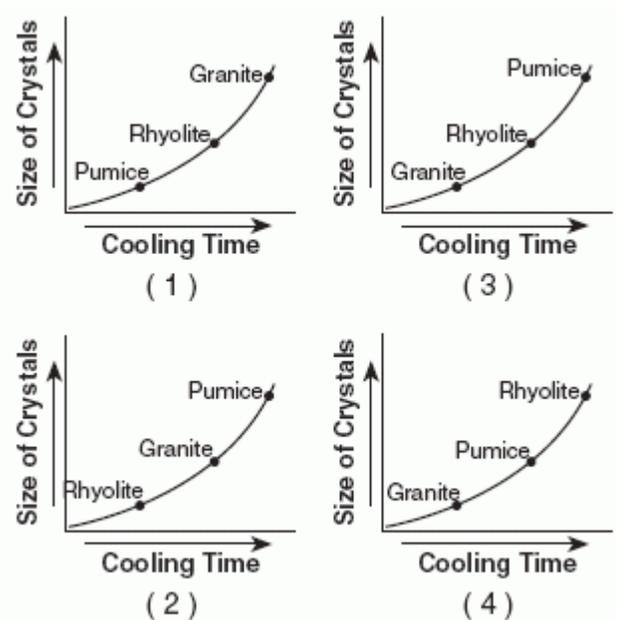
The fine-grained texture of most of the igneous rock formed on the surface of Iceland is due to

1. rapid cooling of the molten rock
2. high density of the molten rock
3. numerous faults in the island's bedrock
4. high pressure under the island

10.) The graph below shows the relationship between the cooling time of magma and the size of the crystals produced. [1]



Which graph (to the right) correctly shows the relative positions of the igneous rocks granite, rhyolite, and pumice?



Directions: Read the passage below and answer the questions that follow.

Volcanic Blast Shaped Earth

*Study finds eruption split an ancient continent,
creating Atlantic Ocean*

The largest volcanic eruption in Earth's history — so powerful it split an ancient supercontinent and created the Atlantic Ocean — spewed millions of square miles of searing lava that extinguished much of life on ancient Earth.

From hundreds of basalt outcrops that rim the Atlantic coasts, scientists have pieced together evidence of the titanic eruption 200 million years ago. Researchers said that the eruption set the fractured landmasses adrift and, by wedging them apart, gradually opened the gulf that created the Atlantic — giving the map of the world the form it has today.

“This is one of the biggest things that has ever happened in Earth's history. This is a gigantic, igneous event and it all seems to have occurred in an amazingly brief amount of time.”

To reconstruct the ancient catastrophe, a team of scientists analyzed basalt dikes, sills, and lavas from the New Jersey Palisades, the Brazilian Amazon, Spain, and West Africa.

By studying the chemical composition and dating the residual radioisotopes in the basaltic rocks, the researchers determined that the rocks all originated from the same eruption. Once they realized the outcrops were linked, they were able to determine that, in the distant past, the rocks all had been located together at the center of an immense continent called Pangea that once stretched, unbroken, from pole to pole.

11.) Scientists stated that rocks from the volcanic eruption that separated the continents are basalt. List two observable characteristics that are normally used to identify basaltic rock. [2]

Base your answers to questions **12 + 13** on the following passage and the diagram on the next page.

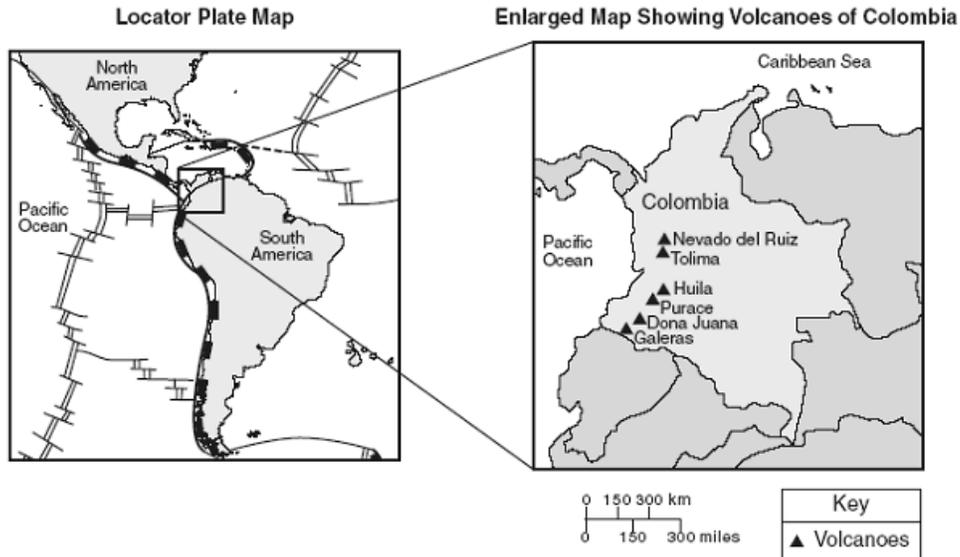
Fire and Ice - and Sluggish Magma

On the night of November 13, 1985, Nevado del Ruiz, a 16,200-foot (4,938 meter) snowcapped volcano in northwestern Colombia, erupted. Snow melted, sending a wall of mud and water raging through towns as far as 50 kilometers away, and killing 25,000 people. Long before disaster struck, Nevado del Ruiz was marked as a trouble spot. Like Mexico City, where an earthquake killed at least 7,000 people in October 1985, Nevado del Ruiz is located along the Ring of Fire. This ring of islands and the coastal lands along the edge of the Pacific Ocean are prone to volcanic eruptions and crustal movements.

The ring gets its turbulent characteristics from the motion of the tectonic plates under it. The perimeter of the Pacific, unlike that of the Atlantic, is located above active tectonic plates. Nevado del Ruiz happens to be located near the junction of four plate boundaries. In this area an enormous amount of heat is created, which melts the rock 100 to 200 kilometers below Earth's surface and creates magma.

Nevado del Ruiz hadn't had a major eruption for 400 years before this tragedy. The reason: sluggish magma. Unlike the runny, mafic magma that makes up the lava flows of oceanic volcanoes such as those in Hawaii, the magma at this type of subduction plate boundary tends to be sticky and slow moving, forming the rock andesite when it cools. This andesitic magma tends to plug up the opening of the volcano. It sits in a magma chamber underground with pressure continually building up. Suddenly, tiny cracks develop in Earth's crust, causing the pressure to drop. This causes the steam and other gases dissolved in the magma to violently expand, blowing the magma plug free. Huge amounts of ash and debris are sent flying, creating what is called an explosive eruption.

Oddly enough, the actual eruption of Nevado del Ruiz didn't cause most of the destruction. It was caused not by lava but by the towering walls of sliding mud created when large chunks of hot ash and pumice mixed with melted snow.



16.) Vesicular texture is very common in igneous rocks formed during andesitic eruptions. Explain how this texture is formed. [2]

17.) What caused the magma to expand, blowing the magma plug free? [2] _____

Sedimentary Rocks

1.) Which rock was most likely formed from pebble-sized sediment deposited in shallow water at an ocean shoreline? [1]

1. shale
2. basalt
3. siltstone
4. conglomerate

2.) Which rock most likely formed as a result of biologic processes? [1]

1. granite
2. basalt
3. sandstone
4. limestone

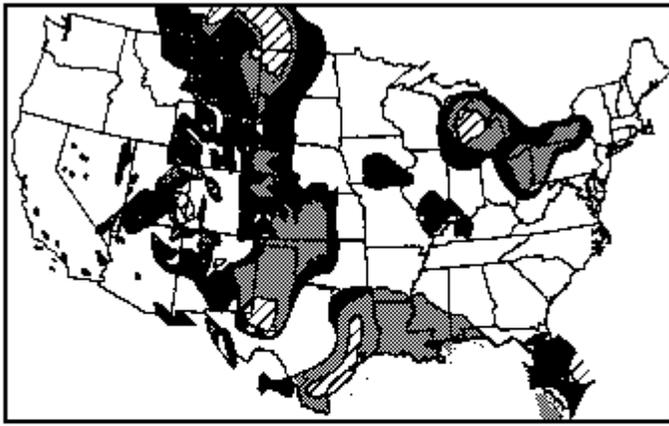
3.) Which sedimentary rock is composed of fragmented skeletons and shells of sea organisms compacted and cemented together? [1]

1. shale
2. limestone
3. sandstone
4. gypsum

4.) Rock layers showing ripple marks, cross-bedding, and fossil shells indicate that these layers were formed [1]

1. from solidification of molten material
2. from deposits left by a continental ice sheet
3. by high temperature and pressure
4. by deposition of sediments in a shallow sea

5.)



KEY

 Gypsum

 Gypsum and halite

 Gypsum, halite, and potassium salts

The map to the left shows certain mineral deposits in the surface bedrock in areas of the United States. What do each of these areas of mineral deposits have in common? [1]

1. They are active fault zones of Earth's crust.
2. They were once covered by evaporating seas.
3. They presently have hot, dry climates.
4. They are sites of active volcanoes.

6.) Which characteristic determines whether a rock is classified as a shale, a siltstone, a sandstone, or a conglomerate? [1]

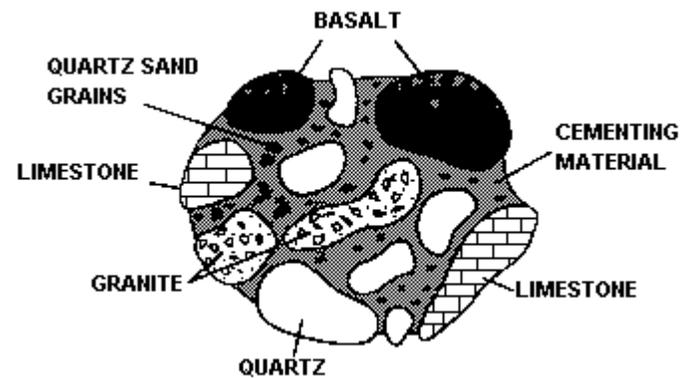
1. the absolute age of the sediments within the rock
2. the mineral composition of the sediments within the rock
3. the particle size of the sediments within the rock

the density of the sediments within the rock

7.) According to the *Scheme for Sedimentary Rock Identification*, particles of which size could have formed shale? [1]

1. 0.2 cm
2. 0.02 cm
3. 0.002 cm
4. 0.0002 cm

8.)

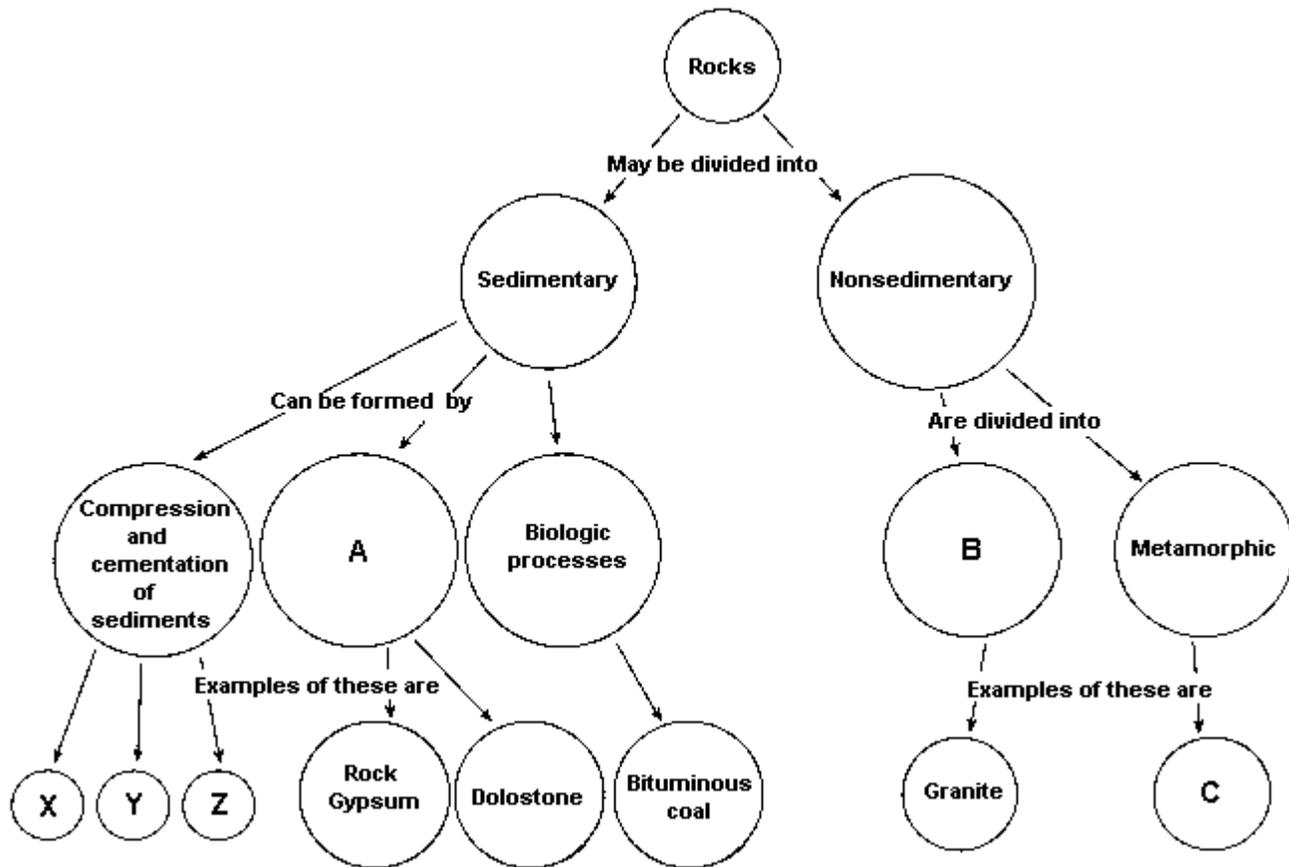


The diagram above represents a conglomerate rock. Some of the rock particles are labeled. Which conclusion is best made about the rock particles? [1]

1. They are the same age.
2. They originated from a larger mass of igneous rock.
3. They all contain the same minerals.
4. They have different origins.
- 5.

9.) Which kind of sedimentary rock may be formed both chemically and organically? [1]

1. limestone
2. rock gypsum
3. rock salt
4. bituminous coal



10.) The diagram ABOVE represents a scheme for classifying rocks. The letter A, B, C and X, Y, Z represent missing labels. Which rocks could be represented by the circles X, Y, and Z? [1]

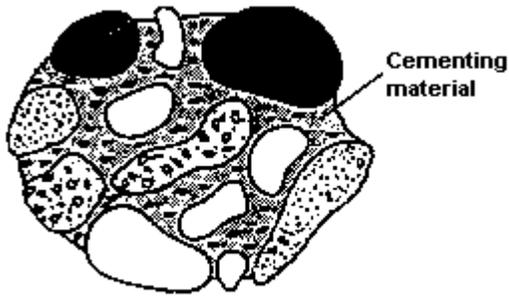
1. sandstone, conglomerate, and siltstone
2. bituminous coal, slate, and schist
3. anthracite coal, metaconglomerate, and rock salt
4. breccia, gneiss, and rhyolite

11.) Which characteristic is most common in sedimentary rocks? [1]

1. foliation
2. layering
3. intergrown crystals
4. glassy texture

12.) Which rock type most often contains fossils? [1]

1. gabbro
2. quartzite
3. limestone
4. metaconglomerate



(Actual size)

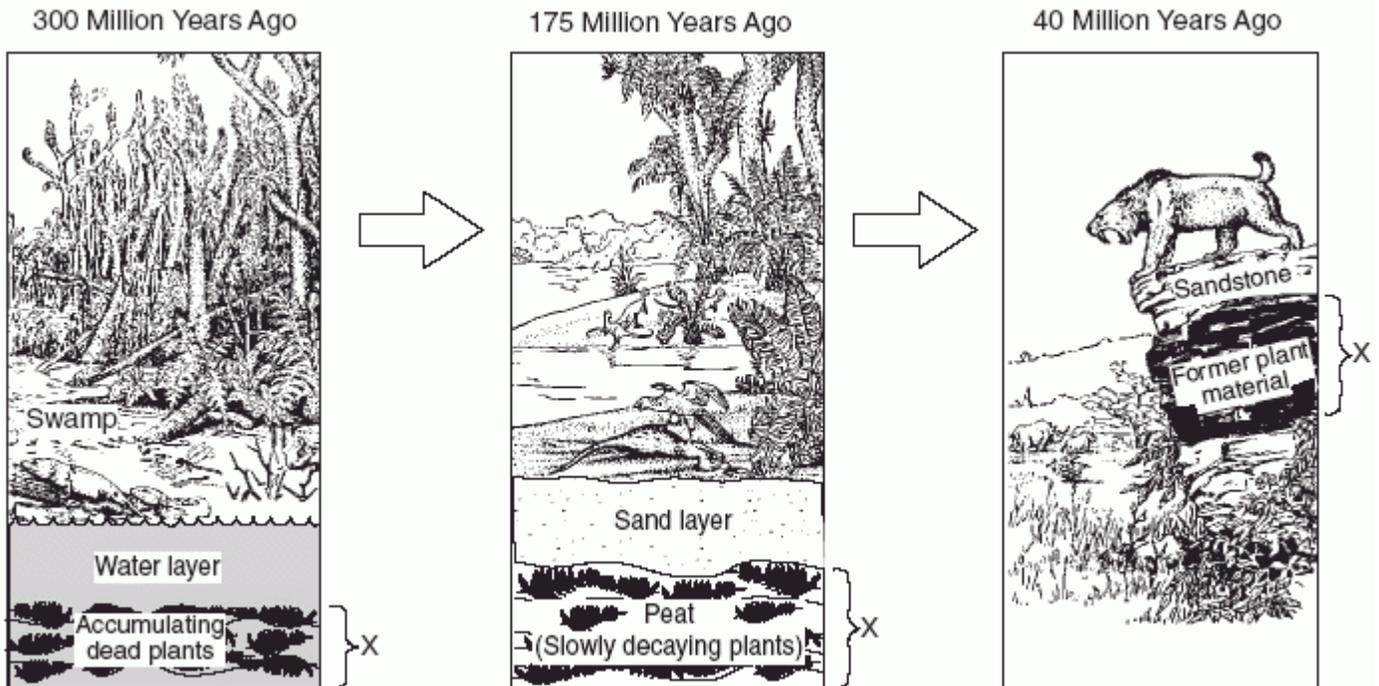
12.) The average size of the pebbles in this sample ABOVE is approximately [1]

1. 1.2 cm
2. 0.2 cm
3. 6.4 cm
4. 13.2 cm

13.) Which process most likely formed a layer of the sedimentary rock, gypsum? [1]

1. precipitation from seawater
2. solidification of magma
3. folding of clay-sized particles
4. melting of sand-sized particles

14.) The sequence of diagrams below represents the gradual geologic changes in layer X, located just below Earth's surface. [1]



Which type of sedimentary rock was formed at layer X?

1. conglomerate
2. shale
3. rock salt
4. coal

Metamorphic Rocks

1.) Where are metamorphic rocks frequently found? [1]

1. on mountain tops that have horizontal layers containing marine fossils
2. within large lava flows
3. as a thin surface layer covering huge areas of the continents
4. along the interface between igneous intrusions and sedimentary rocks

2.) Which mineral is commonly found in the three metamorphic rocks slate, schist, and gneiss? [1]

1. pyroxene
2. feldspar
3. quartz
4. mica

3.) If granite were subjected to intense heat and pressure, it would most likely change to [1]

1. conglomerate
2. sandstone
3. gneiss
4. basalt

4.) While a geology student was walking along several outcrops, she found a rock specimen that showed the following characteristics: [1]

Grain Size – coarse

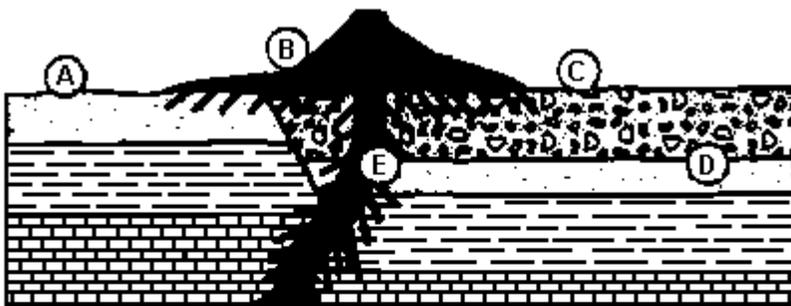
Texture – foliated

Composition – quartz, feldspar, amphibole, garnet, and pyroxene

This specimen should be identified as

1. hornfels
2. slate
3. gneiss
4. anthracite

5.)



Key to Rock Type

	Limestone		Conglomerate
	Shale		Basalt
	Sandstone		Contact Metamorphism

The diagram (to the left) represents a geologic cross-section. At which location would quartzite most likely be found? [1]

1. A
2. B
3. E
4. D

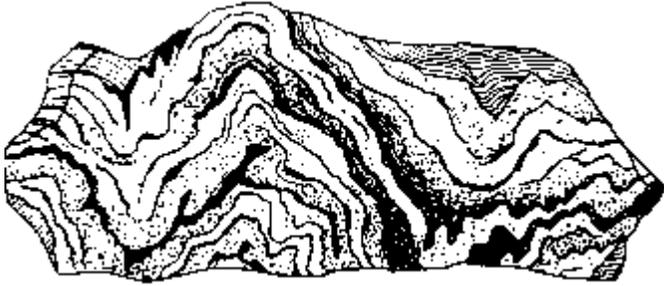
6.) Which rock is foliated, shows mineral alignment but not banding, and contains medium-sized grains of quartz and pyroxene? [1]

1. phyllite
2. schist
3. gneiss
4. quartzite

7.) Slate is formed by the [1]

1. deposition of chlorite and mica
2. foliation of schist
3. metamorphism of shale
4. folding and faulting of gneiss

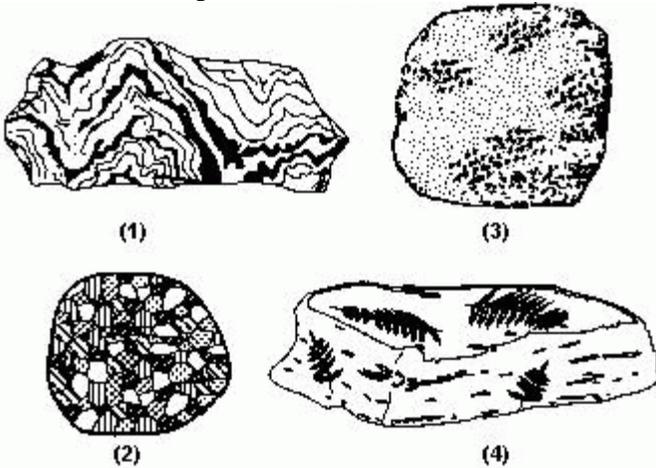
8.)



The diagram ABOVE represents a rock with a distorted layer structure. The distorted structure of this rock is most likely the result of: [1]

1. a long period of weathering
2. glacial activity
3. wind erosion
4. extreme pressure

9.) Which rock sample (BELOW) is most likely a foliated metamorphic rock? [1]



10.) During the Permian Period, sedimentary bedrock in the Appalachian Region was subjected to high temperature and pressure. Calcite deposits that had existed in this environment would most likely have formed: [1]

1. schist
2. gabbro
3. marble
4. gneiss

11.) Bedrock located near Old Forge, New York, would most likely have which characteristics? [1]

1. clastic texture consisting of angular sediments of mostly quartz and feldspar cemented together
2. crystalline texture composed predominantly of gypsum
3. noncrystalline, glassy texture with a dark color
4. foliated texture with mica and feldspar separated into bands

END