Rocks and Minerals Div B - Answer Key

This test is worth 105 points

Station 1

1. __Fe_____
2. __Fe_____
3. __Cu_____
4. __Fe_____
5. __Mn_____
6. __Cr_____

Station 2

7. __Tourmaline_____
8. __Epidote_____

Station 3

9. __Rhyolite_____
10. __Graphite_____

Station 4

11. __Talc_____
12. __polysynthetic twinning_____

Station 5

13. __Granite or leucogranite_____
14. ___Andesite_____
15. ___Pegmatite_____

Station 6

16. ___Slate_____
17. ___Gneiss_____

Station 7

18. __Breccia_____
19. __Diatomite_____
20. __oolitic limestone_____

Station 8

21. __isometric (prism, like a shoebox)_____
22. __orthorhombic(octahedron; 8 equilateral triangle sides)_____
23. __isometric (tetrahedron; 4 equilateral triangle sides)

Station 9

24. A B C D E
25. A B C D E
26. A B C D E
27. A B C D E

Station 10

28. _M_____
29. _I_____
30. _S_____

Station 11

31. __Sulfides_____
32. __Cu (chalcopyrite)_____
33. __Pb (galena)_____
34. __Zn (sphalerite)_____

Station 12

35. A B C D E F G
36. A B C D E F G
37. A B C D E F G
38. A B C D E F G
39. A B C D E F G
40. A B C D E F G
41. A B C D E F G

Station 13

42._silicates (hornblende)__
43._carbonates (calcite)_____
44._native elements (native sulfur)_

Station 14

45._Gneiss_____
46._Diorite_____
47._***igneous diorite might be metamorphosed (subjected to heat and pressure) to produce metamorphic gneiss. Alternatively, you could melt the metamorphic gneiss and allow it to crystallize to produce igneous diorite.***_____

Station 15

48.__***Streak is the color of the powder of a mineral when rubbed on a ceramic streak plate. In order to create a powder, the mineral must be softer than the streak plate. When minerals that are harder than the plate (such as corundum and topaz) are rubbed, they produce a (white) powder from the plate itself, not from the mineral.***

Station 16

49._Marble_____
50._Quartzite_____
51._Limestone_____
52._Sandstone/arenite____

Station 17

53._Fine_____
54._Mafic_____
55._Diabase____
56.A B C D E
57.A B C D E

Station 18

58.A B C D E
59.A B C D E

Station 19

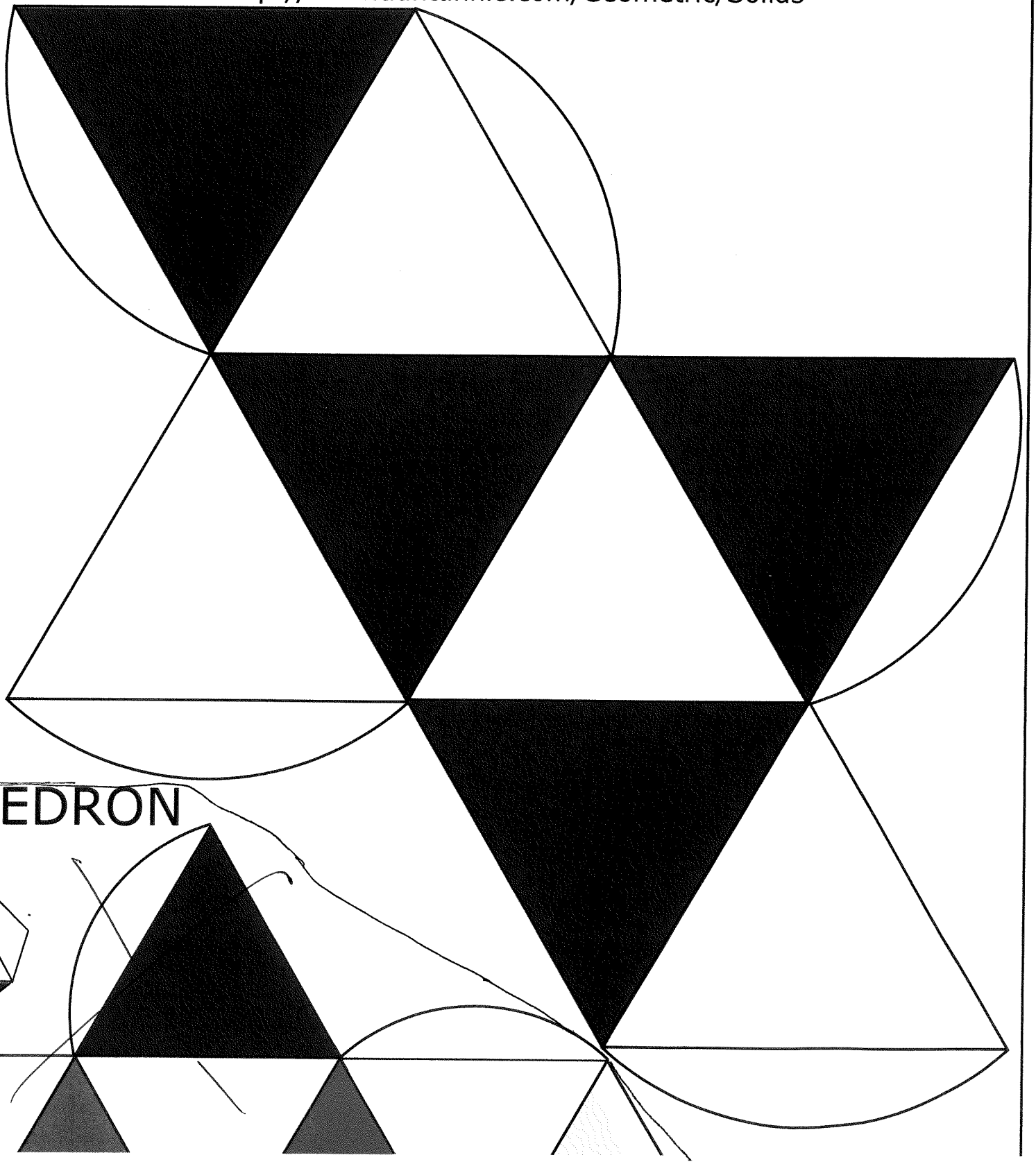
60.A B C D E F G H I J
61.A B C D E F G H I J
62.A B C D E F G H I J

Station 20

63.A B C D E F G H I
64.A B C D E F G H I
65.A B C D E F G H I

Pattern for Geometric Solids

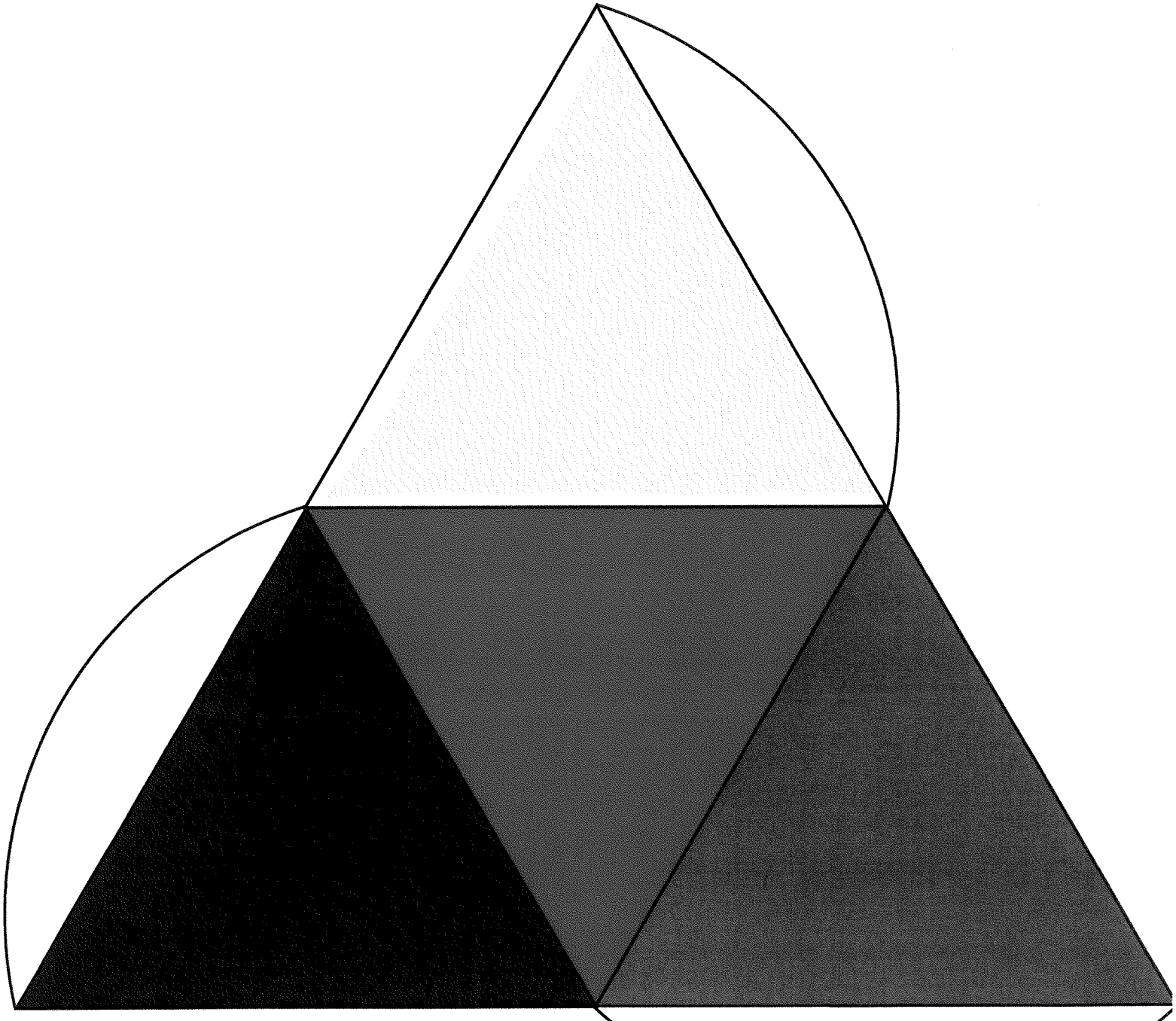
How to Make: http://www.auntannie.com/Geometric/Solids



HEDRON

Pattern for Geometric Solids

How to Make: http://www.auntannie.com/Geometric/Solids



TETRAHEDRON

Orthodiambic

Instructions:

1. For best results, copy these patterns onto cardstock.
2. Color the crystal shapes before cutting them out.
3. Cut along the solid lines.
4. Use a blunt pair of scissors to crease along the dashed lines.
5. Glue the tabs to the inside of the model.
6. See images of completed models at right.

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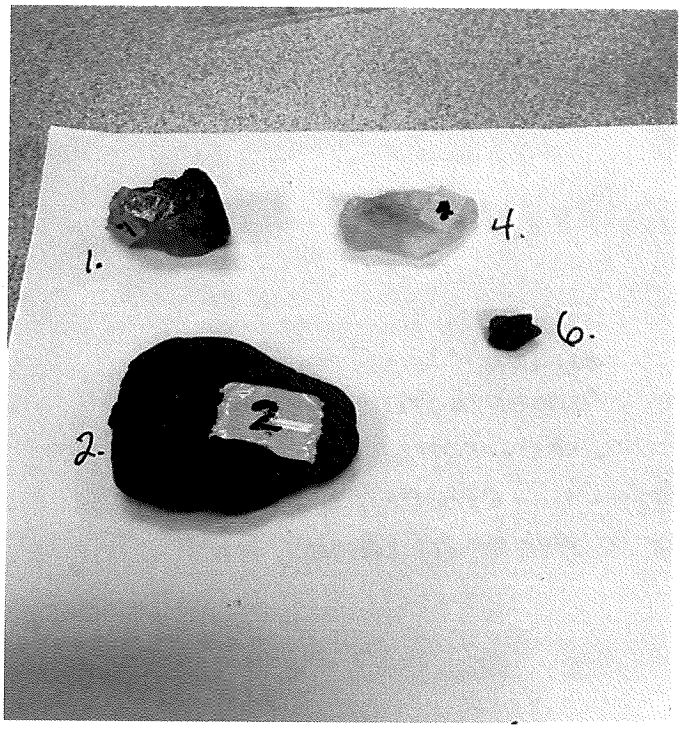
Station 1

(1 point each) For each of these colored minerals, indicate the chemical element that is responsible for the distinctive color. Choose elements from this list –
Al (aluminum), Na (sodium), Fe (iron), Mn (manganese), Cr (chromium), Cl (chlorine), Cu (copper), Ca (calcium). Answers may be used any number of times, including zero.

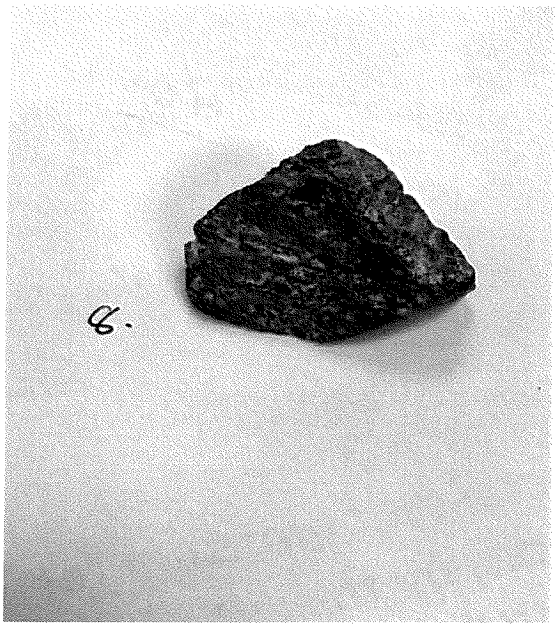
1. (see sample) _____
2. (see sample) _____
3. Azurite/blue _____
4. (see sample) _____
5. Rhodonite/pink _____
6. (see sample) _____



Station 2

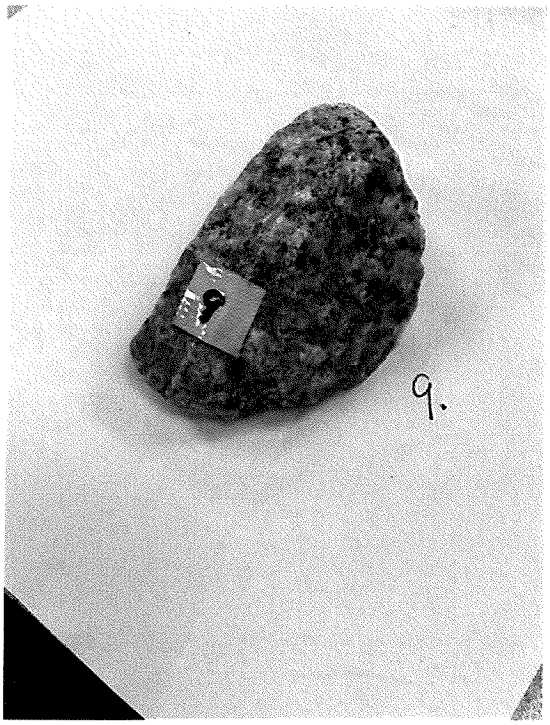
7. (2 points) This gemmy variety of a common mineral is known as the watermelon variety, because it is pink on the inside and green on the outside (just like a watermelon!). It is a variety of which mineral group?

8. (2 points) I am an example of a mineral that typically forms in low-grade metamorphic rocks, by the alteration of common plagioclase feldspar. What is my name?



Station 3

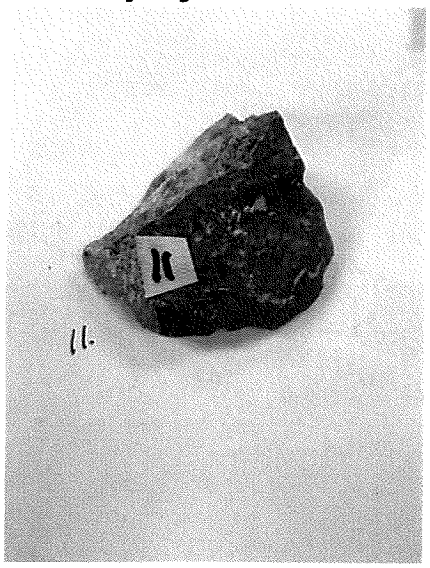
9. (2 points) Examine this igneous rock specimen. <u>If</u> the magma that it formed from had erupted from a volcano, <u>then</u> what type of rock would have been formed?



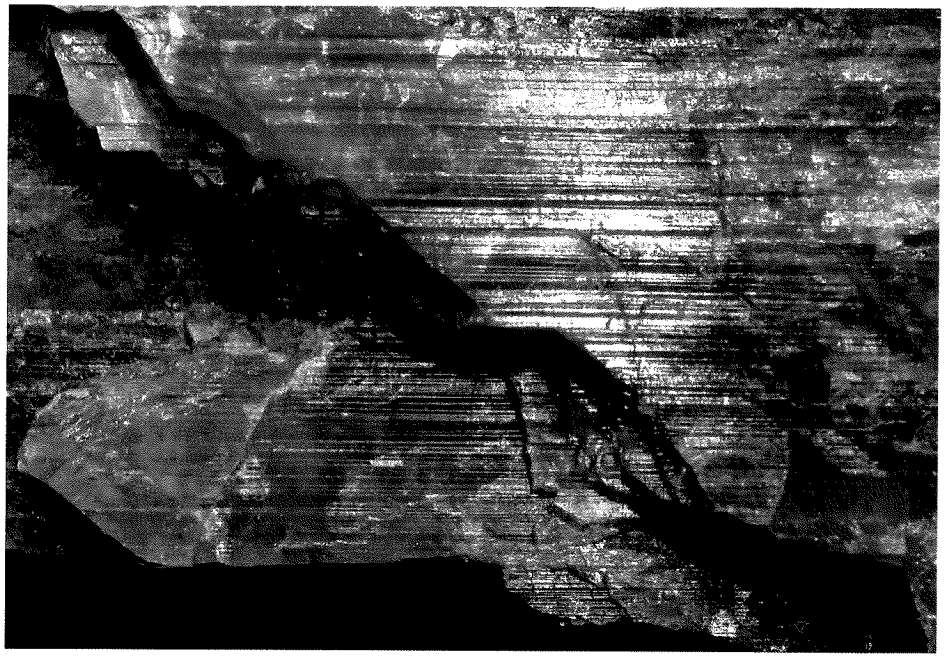
10. (2 points) Lead Mine Road, located in Wake County, does not get its name from an actual lead (Pb) mine. It is named for a different sort of lead. The mine that it is named for was dug into what very soft mineral that produces a dark gray streak?

Station 4

11. (2 points) Examine this specimen. It is a metamorphic rock called <u>soapstone</u>, which can be used for carvings or for chemistry lab tabletops. It is composed mostly of what mineral?



12. (2 points) This photograph of a very common mineral shows an outstanding example of what feature?



Station 5

13. (2 points) I am a coarse-grained igneous rock composed of 40% orthoclase, 20% albite, 25% quartz and 5% biotite. What is my name?

14. (2 points) I am an igneous rock that was erupted from a volcano. I am intermediate in composition. What is my name?

15. (2 points) I am a light-colored igneous rock containing mostly extremely large crystals of feldspar and quartz. What is my name?

Station 6

16. (2 points) I am a fine-grained metamorphic rock that breaks into thin platy slabs that may be used for roofing, walkways, and blackboards. What is my name?

17. (2 points) I am a coarse-grained metamorphic rock composed of 60% feldspars, 20% quartz, and 20% biotite. I am arranged in bands that alternate from biotite-rich to biotite-free. What is my name?

Station 7

18. (2 points) I am a coarse sedimentary rock composed of angular fragments of pre-existing rocks cemented together. What is my name?

19. (2 points) I am an extremely fine-grained and light-colored sedimentary rock consisting of the siliceous remains of single-celled algae. What is my name?

20. (2 points) I am a sedimentary rock consisting of tiny spherical grains that have concentric layers of calcium carbonate. What is my name?

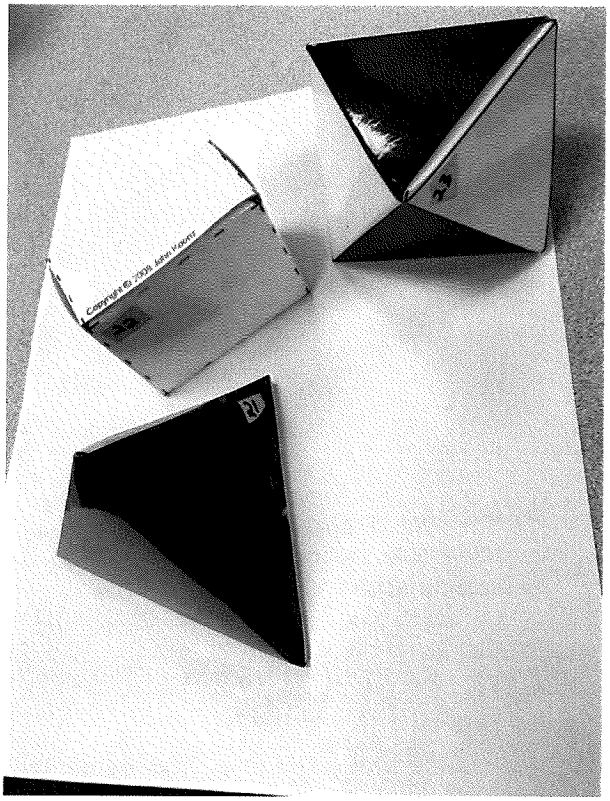
Station 8

(2 points each) For each of the following crystal shapes, select the crystal system to which it belongs. Crystal Systems to choose from are Isometric, Hexagonal, Tetragonal, Orthorhombic, Monoclinic, and Triclinic. They may be used any number of times, including zero. (Color does not matter)

21. _____

22. _____

23. _____



Station 9

(1 point each) From the following list of answers, use the correct letter to identify the rock or mineral described in questions 24 – 27. Answers may be used any number of times, including zero.

Answer List: ***A. Staurolite*** ***B. Pyrophyllite*** ***C. Kyanite*** ***D. Milky quartz*** ***E. Beryl***

24. Some of the best emeralds in the US occur in North Carolina. In fact, emerald is the State Gemstone. Emerald is a variety of what mineral?

25. Fairystone State Park, located in southern Virginia, gets its name from twinned crystals that resemble a cross or the letter X. These are examples of what mineral?

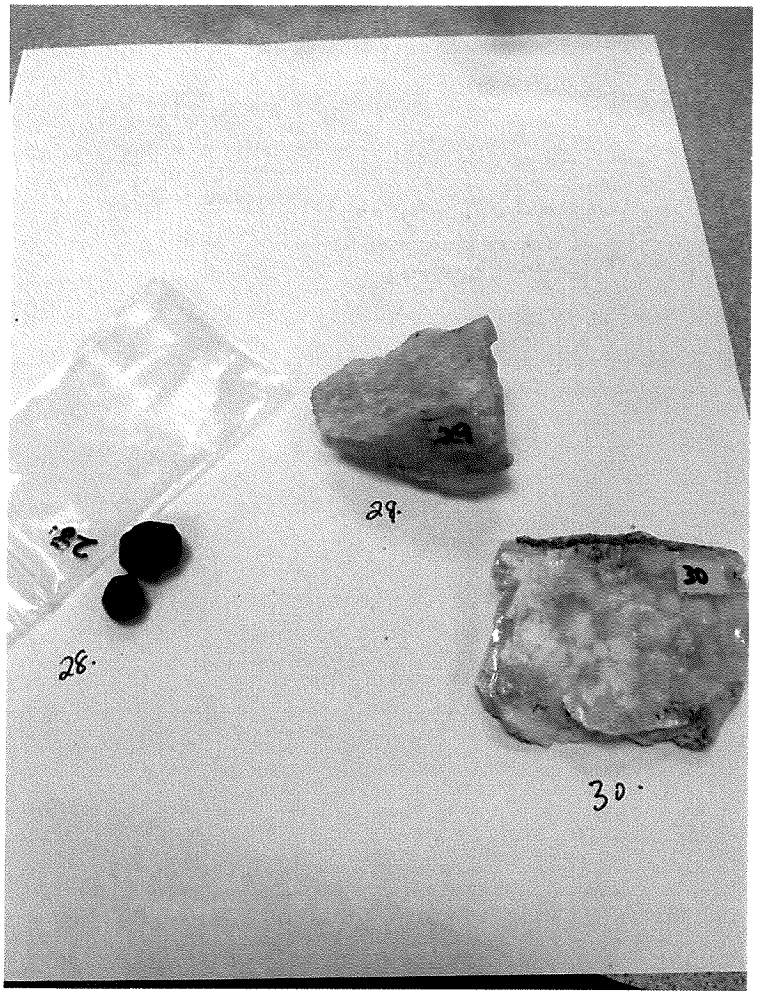
26. What flat, bladed, and commonly bluish mineral, that forms under relatively high-pressure metamorphic conditions, is found in many places in the Piedmont and Blue Ridge Mountains of North Carolina?

27. What soft, white mineral, mined in Orange and Moore Counties, does North Carolina produce more of than any other state?

Station 10

(2 points each) Indicate whether the following minerals occur primarily in igneous (I), sedimentary (S), or metamorphic (M) rocks.

28. _____
29. _____
30. _____



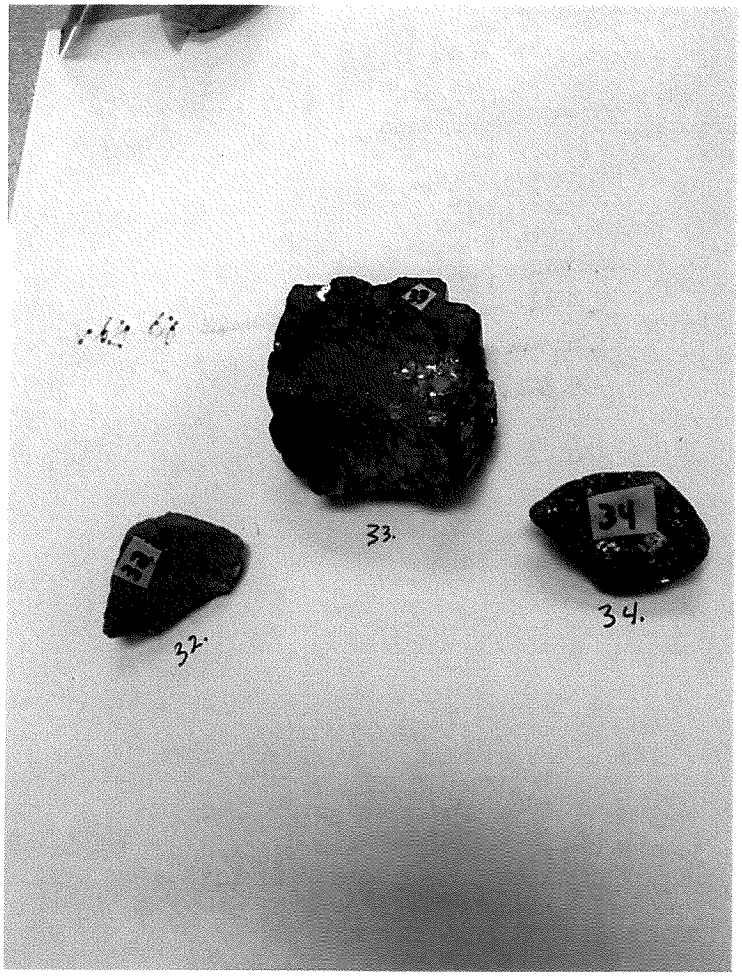
Station 11

(2 points) Here are three minerals from the same compositional group.

31. What compositional group do they belong to?

(1 point each) For what metal is each of these minerals mined?

32. _____
33. _____
34. _____

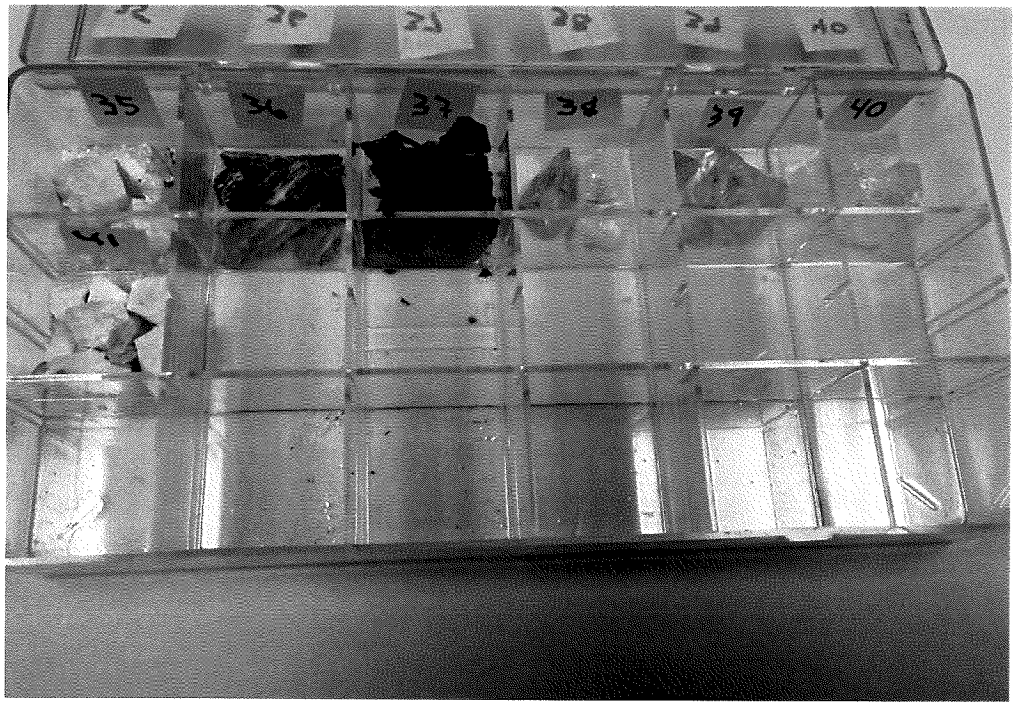


Station 12

(1 point each) Examine the mineral fragments in the seven compartments in the sample box. These display seven different types of cleavage. Match the minerals with the type of cleavage they display, using the letters A-G. Each letter is used once.

35. _____
36. _____
37. _____
38. _____
39. _____
40. _____
41. _____

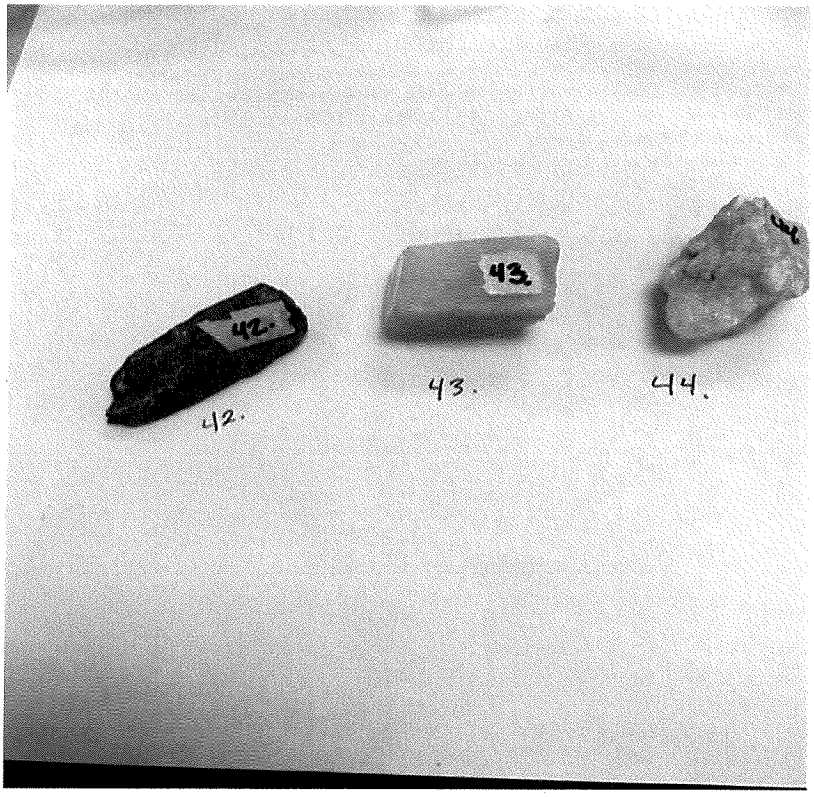
A. two not at 90°
B. none
C. three not at 90°
D. three at 90°
E. four not at 90°
F. two at 90
G. one



Station 13

(2 points each) For each of these minerals, indicate the chemical group to which it belongs. Chemical groups are: silicates, oxides/hydroxides, native elements, halides, carbonates, sulfides, sulfates, borates, and phosphates.

42. _____
43. _____
44. _____

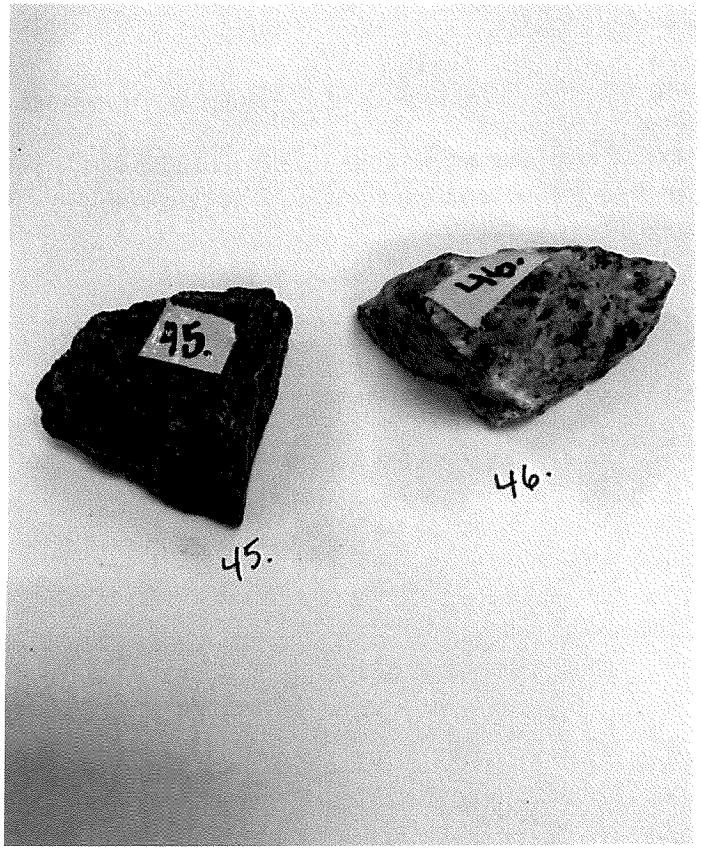


Station 14

(2 points each) Identify these two rocks.

45. _____

46. _____



(3 points) Referring to the Rock Cycle, describe how they might be related.

47.

Station 15

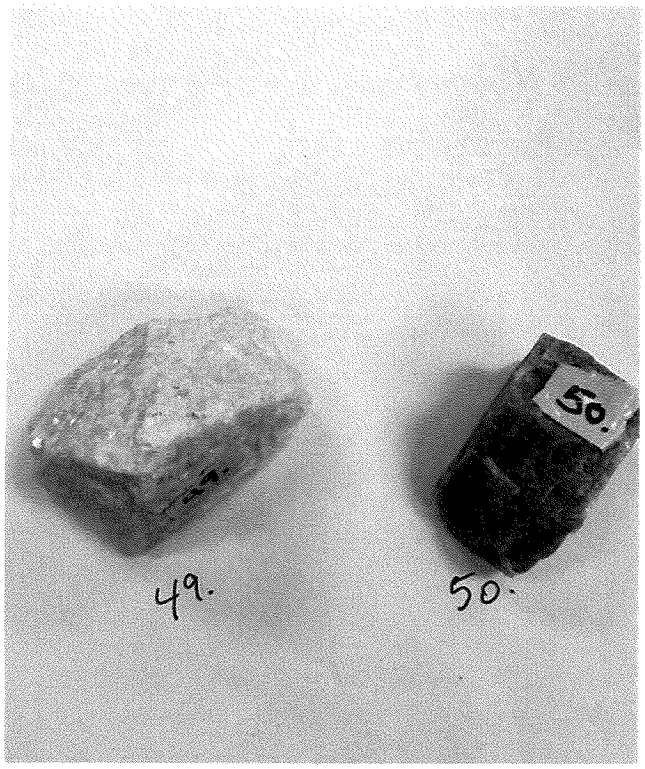
48. (5 points; TIEBREAKER) Why does it not make sense to describe the streak of corundum or topaz?

Station 16

(2 points each) These two specimens are metamorphic rocks. Identify them.

49. _____

50. _____



(1 point each) What type of sedimentary rock is a likely parent for each?

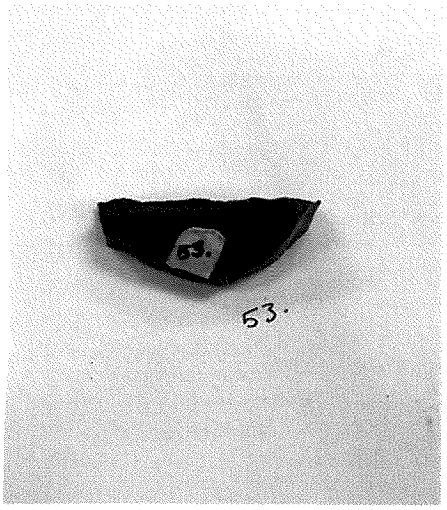
51. _____ is a parent for 49.

52. _____ is a parent for 50.

Station 17

(1 point each) Examine this igneous rock specimen.

53. Is it fine-grained or coarse-grained?



54. Based on its color, is it most likely felsic, intermediate, or mafic?

55. It is related to basalt and gabbro, but has a different name. What is it called?

56. Why is it distinguished from basalt and gabbro?

A. It is restricted to the northern hemisphere.
B. It is coarser grained than basalt, but finer than gabbro.
C. It contains no feldspar.
D. It contains no pyroxene (e.g. augite).
E. It has a silica content >70%.

57. It has the same composition as the igneous rock of the ocean floor. What ancient tectonic event does this rock record in North Carolina?

A. The plate collision that formed the Appalachian Mountains.
B. The closing of an ancient ocean (Iapetus).
C. The break-up of a supercontinent (Pangea).
D. A huge volcanic eruption from an island arc.
E. Subduction of Pangea.

Station 18

58. (2 points) Native Americans who lived in the region of the Uwharrie Mountains of central North Carolina made stone tools out of a local rock that is a metamorphosed variety of _____.

A. Spodumene B. Rhyolite C. Gabbro
D. Dolostone E. Amazonite

59. (2 points) The rare igneous rock websterite is named for the town of Webster, NC. It is a dark-colored rock containing no quartz or feldspar, only two varieties of pyroxene, including augite. Websterite would be classified as a/an _____ igneous rock.

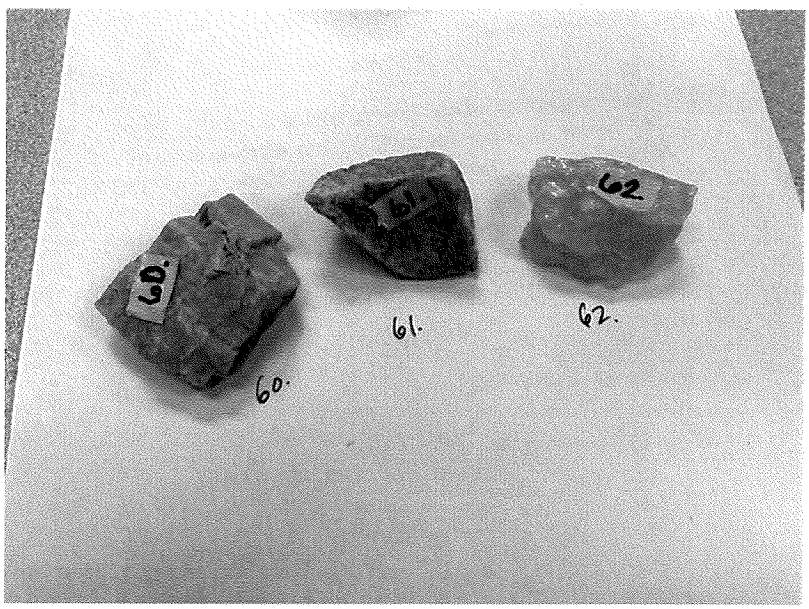
A. Felsic B. Intermediate C. Mafic
D. Ultramafic E. Volcanic

Station 19

(2 points each) *Identify the following minerals using names from the following list (answers may be used any number of times, including zero):*

A. Quartz B. Olivine C. Fluorite D. Epidote
E. Almandine F. Kyanite G. Orthoclase
H. Tourmaline I. Graphite J. Pyrophyllite

60. _____
61. _____
62. _____



Station 20

(2 points each) *Identify the following rocks using the names from the following list (answers may be used any number of times, including zero):*

A. Rhyolite *B. Obsidian* *C. Arkose*
D. Schist *E. Slate* *F. Scoria*
G. Gabbro *H. Diorite* *I. Andesite*

63. _____
64. _____
65. _____