Rocks and Minerals—Science Olympiad 2013

Name

1. Order the following in order of increasing carbon content: Lignite, Anthracite, Peat, Bituminous Coal

   _____

2. Identify and order the following minerals from lowest to highest on the Bowen's reaction series.

1. 

2. 

3. 

4. 

_____ _____ _____ __ _____

Order: _____

3. Suppose you come across a black, average-looking mineral on your worldwide travels. Of the following minerals, which is it least likely to be?

   Sphalerite, Hornblende, Augite, Limonite

   _____

4. Name the difference between calcite and aragonite.

_____

_____

5. Which two materials make up mafic and felsic rocks, respectively?

_____

_____

6. Which clastic rocks are composed of rounded and angular rock fragments, respectively?

_____

7. Hornfels is created by which metamorphic process?

_____

Name

8. Which is the first mineral to crystallize from the very high temperatures as magma first starts to cool?

9. Which is the last mineral to form from the last remaining melt of high silica content?

10. (T-F) Bowen's reaction series indicates that minerals with the highest melting temperatures crystallize from a cooling magma before those with lower melting points.

11. (T-F) Bowen's reaction series indicates that ferromagnesian minerals in magma crystallize in the sequence shown in the discontinuous branch.

12. (T-F) Bowen's reaction series offers an explanation for the differentiation of felsic and mafic minerals in magma.

13. Which bonding occurs at the highest temperatures within the Discontinuous Branch?
    a. ionic b. covalent

The following questions refer to the two branches of the Bowen's Reaction Series.

14. Which reaction series follows a repetitive sequence of stable to unstable pattern, not permitting simultaneous formation of similar minerals?

    a. continuous b. discontinuous

15. Which reaction series follows a gradual transitional pattern of mineral formation thus permitting combinations of minerals to form and exist as the magma cools?
    a. continuous b. discontinuous

16. Which list the sequence of ferromagnesian silicate minerals crystallizing from a cooling magma?
a. amphibole, olivine, biotite, pyroxene c. olivine, pyroxene, amphibole, biotite
b. biotite, amphibole, pyroxene, olivine d. pyroxene, olivine, amphibole, biotite

17. Of the following, which rock type is most likely to contain calcium-rich feldspar?
    a. basalt b. granite c. pumice d. rhyolite

18. Of the following paired minerals, which are characteristic of lower crystallization temperatures and absent in basalt and gabbro?

    a. pyroxene and olivine c. biotite and olivine
    b. quartz and pyroxene d. quartz and muscovite

19. Which rock is composed of finely to coarsely crystalline calcite or dolomite and was formed during metamorphism of limestone or dolomite rock?

20. Which rock is composed of fine to coarse crystalline quartz and is derived from metamorphism of quartz sandstone and chert?

Name

21. Which rock was derived from regional metamorphism of high-silica igneous rocks and muddy sandstones?

22. Describe the cleavage angles of a monoclinic, orthorhombic, and triclinic crystal system.

_____

_____

23. Classify the following rocks as sedimentary, metamorphic, or igneous.
Gneiss, Gabbro, Phyllite, Breccia, Andesite

Sedimentary: _____

Metamorphic: _____

Igneous: _____

24. You are asked to identify a mineral. It has a metallic red-to-black color, is not magnetic, and when scratched across a streak plate, it leaves a dark red mark. What is it?

_____

25. You are asked to identify a mineral. It is shiny, metallic, and dense. You notice cubic crystals. What is it?

_____

26. You are asked to identify a mineral. It is pale in color and takes the shape of the petals of a rose. Which two minerals could it be?

_____

ROCKS AND MINERALS IDENTIFCATION BONANZA

27. Identify the following minerals by picture.

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Name



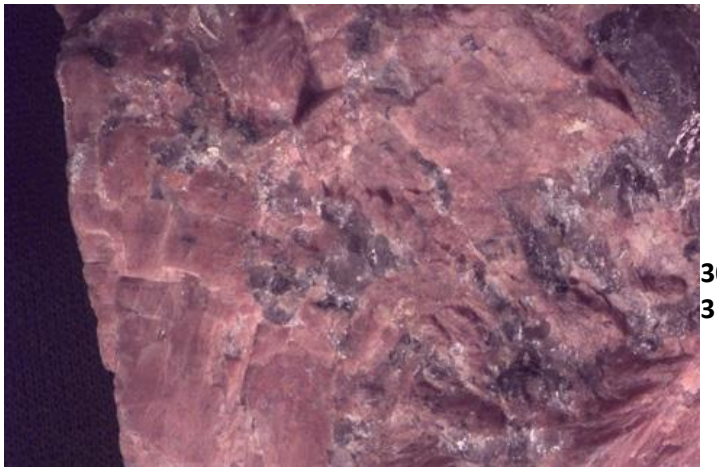

_____ _____ _____ _____




_____ _____ _____ _____

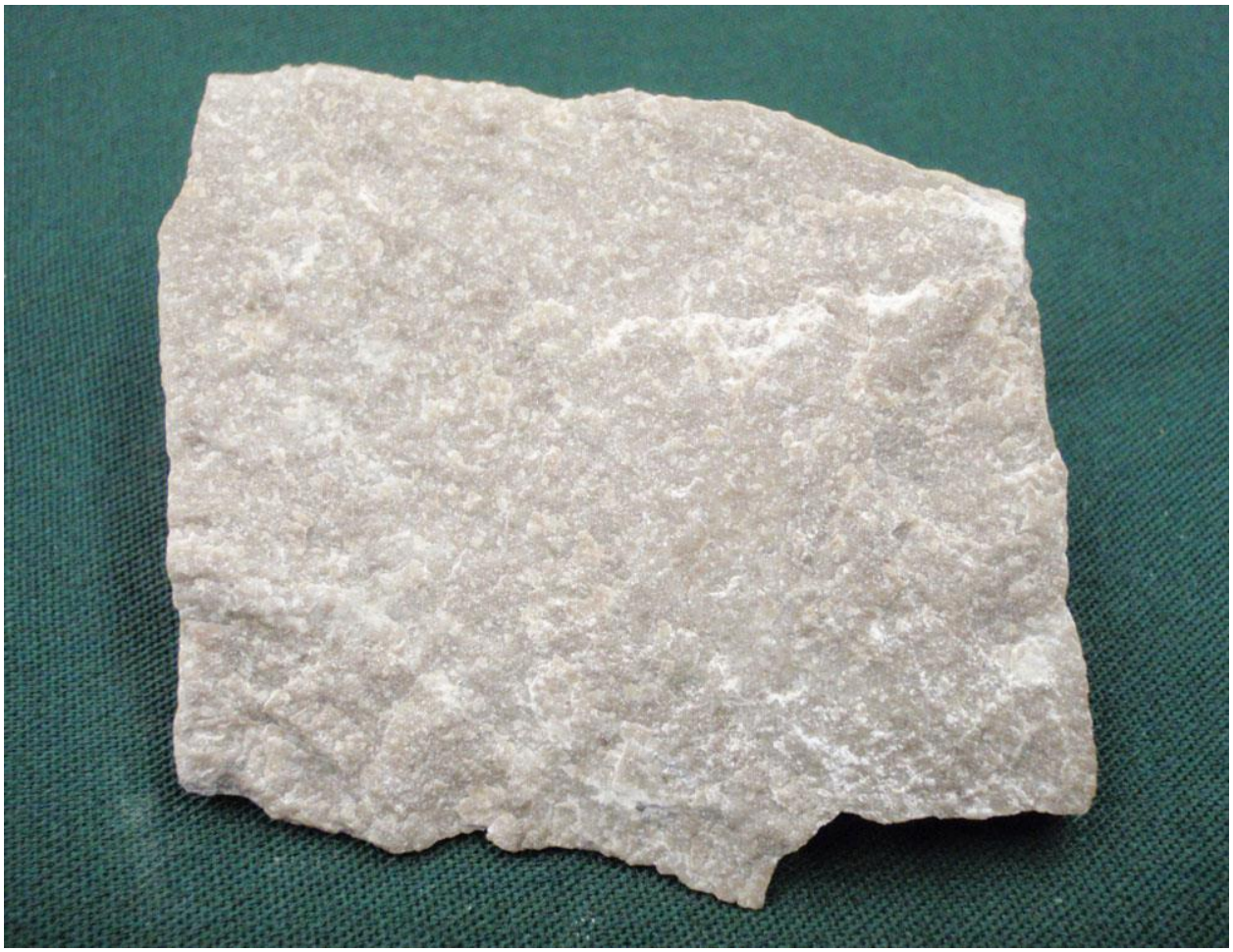
Name

28. Identify: **29. Usage?**



30. Identify:
31. Average melting temperature is:

Name



32.Identify:

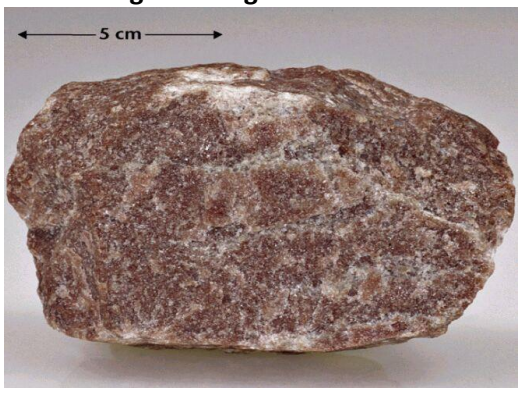
33. This mineral is _____ percent of all _____ rocks in the world.

34.Identify:

Name

35. Identify: **36. What minerals is this rock mostly made of?**

37. How big are the grain sizes?



38. Identify:

39. Parent rock?

Name

40. Identify: **41. Crystal form?**

42. Commonly found in what kind of rocks?

43. Identify: (multiple answers will be accepted, try your best):

Name

44. Identify:
45. Usage?

46. Identify:
47. Usage?

Name

48. Identify:

49. Identify two minerals:

50. What is the colloquial name? Where is this famously found (but still found in many other places)?

Name

51. Identify:

52. State mineral of what state?

53. Identify: