

School:

Names:

Team Number:

Rocks and Minerals

*Wright State Invitational
January 28, 2012*

59 Questions

IMPORTANT: THERE WILL BE A $\frac{1}{4}$ POINT DEDUCTION FOR EACH WRONG ANSWER. CORRECT ANSWERS WILL BE WORTH 1 POINT AND BLANK ANSWERS WILL BE SCORED AS 0 POINTS

ALWAYS CHOOSE THE BEST AND MOST SPECIFIC ANSWER

You will have 3 minutes at each station.

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Science Olympiad 2012 Wright State Invitational Rocks & Minerals Test

Specimen 1. Use this specimen for questions 1-4

1. Identify this specimen.
2. What is the chemical formula (MUST be written as chemical symbols)?
3. Minerals in this family consist of anions in what group on the periodic table?
 - (a) Group 1
 - (b) Group 2
 - (c) Group 16
 - (d) Group 17
4. Which is NOT a use of this mineral?
 - (a) High-performance telescope lenses
 - (b) Crystal oscillators
 - (c) Aluminum smelting
 - (d) Acid production

Specimen 2. Use this specimen for questions 5-8.

5. Identify this specimen (see picture at station).
6. This mineral is an important ore of what metal?
 - (a) Iron
 - (b) Copper
 - (c) Sulfur
 - (d) Zinc
7. What is the nickname of this mineral?
 - (a) "Fairy Stone"
 - (b) "Fool's Gold"
 - (c) "Peacock Ore"
 - (d) "TV Rock"
8. What is the chemical formula (MUST be written as chemical symbols)?

Specimen 3. Use this specimen for questions 9-11

9. Identify this specimen.
10. In what kind(s) of igneous rock is this mineral commonly found?
 - (a) Mafic rocks
 - (b) Ultramafic rocks
 - (c) Intermediate rocks
 - (d) Both A & B
 - (e) Both A & C
11. This mineral's location in Bowen's reaction series is an indication of what?
 - (a) It formed at high temperatures deep in the Earth and is unstable at Earth's surface
 - (b) It formed at low temperatures near Earth's surface and is stable at Earth's surface
 - (c) It formed at high temperatures deep in the Earth and is stable at Earth's surface
 - (d) It formed at low temperatures deep in the Earth and is unstable at Earth's surface

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Specimen 4. Use this specimen for questions 12-15

12. Identify this specimen.

13. In what type of igneous rock is this mineral usually found?

- (a) Ultramafic
- (b) Mafic
- (c) Intermediate
- (d) Felsic

14. What is the hardness of this mineral?

- (a) 1-2
- (b) 2-3
- (c) 3-4
- (d) 4-5

15. This mineral is NOT used for _____

- (a) Window panes
- (b) Age dating igneous rocks
- (c) Insulation
- (d) Lubricants

Specimen 5. Use this specimen for questions 16-19

16. Identify this specimen.

17. Which is NOT a property of this mineral?

- (a) Fluorescence
- (b) Piezoelectricity
- (c) Birefringence
- (d) Retrograde solubility

18. What mineral is a polymorph of this mineral?

- (a) Dolomite
- (b) Vaterite
- (c) Calcite
- (d) Selenite

19. What metamorphic rock is composed largely of this mineral?

- (a) Dolostone
- (b) Limestone
- (c) Sandstone
- (d) Marble

Specimen 6. Use this specimen for questions 20-22

20. Identify this specimen.

21. What is the dominant clast size of this specimen?

- (a) Granule
- (b) Pebble
- (c) Cobble
- (d) Boulder

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22. Which is NOT a common depositional environment of this specimen?

- (a) Deep water marine
- (b) Shallow marine
- (c) Fluvial
- (d) Alluvial
- (e) Aeolian

Specimen 7. Use this specimen for questions 23-26

23. Identify this specimen.

24. Which best describes the texture of this rock?

- (a) Glassy
- (b) Aphanitic
- (c) Porphyritic
- (d) Phaneritic

25. What is the extrusive equivalent of this rock?

- (a) Andesite
- (b) Rhyolite
- (c) Dacite
- (d) Basalt

26. This specimen would most likely be the parent rock of which metamorphic rock?

- (a) Quartzite
- (b) Gneiss
- (c) Marble
- (d) Phyllite

Specimen 8. Use this specimen for questions 27-30

27. Identify the specimen.

28. How is this rock classified?

- (a) Organic
- (b) Inorganic
- (c) Clastic
- (d) Chemical

29. What is the depositional environment of this rock?

- (a) Deep marine
- (b) Rivers
- (c) Beaches
- (d) Swamps

30. Deposits of this specimen in the United States are approximately how old?

- (a) Less than 50 million years old
- (b) 50 – 100 million years old
- (c) 100 – 300 million years old
- (d) More than 300 million years old

Specimen 9. Use this specimen for questions 31-34

31. Identify the specimen.

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32. What degree of metamorphism does this specimen exhibit?

- (a) Low grade metamorphism
- (b) Intermediate grade metamorphism
- (c) High grade metamorphism
- (d) No metamorphism

33. Which of these best describes the specimen's parent rock?

- (a) Limestone
- (b) Gneiss
- (c) Sandstone
- (d) Shale

34. Under what conditions did this rock most likely form?

- (a) Low pressures and low temperatures
- (b) Low pressures and high temperatures
- (c) High pressures and low temperatures
- (d) High pressures and high temperatures
- (e) Intermediate pressures and temperatures

Specimen 10. Use this specimen for questions 35-38

35. Identify the specimen

36. How is this rock compositionally classified?

- (a) Ultramafic
- (b) Mafic
- (c) Intermediate
- (d) Felsic

37. What does this rock tell you about its formation?

- (a) It's intrusive, so it must have cooled slowly
- (b) It's intrusive, so it must have cooled rapidly
- (c) It's extrusive, so it must have cooled slowly
- (d) It's extrusive, so it must have cooled rapidly

38. Which mineral is NOT commonly found in this rock?

- (a) Quartz
- (b) Plagioclase
- (c) Olivine
- (d) Orthoclase

Specimen 11. Use this specimen for questions 39-42

39. Identify this specimen.

40. What is the chemical formula (MUST be written as chemical symbols)?

41. This mineral would react with HCl to produce what gas?

42. What element is responsible for the color of this specimen?

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Specimen 12. Use this specimen for questions 43-46

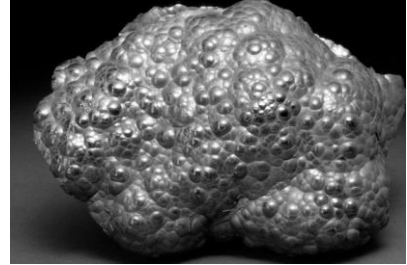
43. Identify this specimen.

44. What is the chemical formula (MUST be written as chemical symbols)?

45. This mineral is an important ore of what metal?

46. What is the mineral habit of the specimen shown at right? →

- (a) Pisolitic
- (b) Reniform
- (c) Botryoidal
- (d) Massive



Specimen 13. Use this specimen for questions 47-50

47. Identify this specimen.

48. What is the chemical formula (MUST be written as chemical symbols)?

49. Which is NOT a common use of this mineral?

- (a) Jewelry
- (b) Eye make-up
- (c) Battery production
- (d) Radio receivers

50. Deposits of this mineral are often associated with the following metals EXCEPT _____?

- (a) Silver
- (b) Iron
- (c) Zinc
- (d) Cadmium

Specimen 14. Use this specimen for questions 51-55

51. Identify this specimen.

52. What is the chemical formula (MUST be written as chemical symbols)?

53. How are the SiO_4 tetrahedra organized in this mineral?

- (a) In closed ring units
- (b) In a continuous framework
- (c) In continuous double chain units
- (d) In continuous sheet units

54. Which is NOT a use of this mineral?

- (a) Ceramics
- (b) Paint
- (c) Plaster of Paris
- (d) Food additive in toothpaste

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55. The presence of this mineral indicates what type of climate?

- (a) Arid
- (b) Warm and humid
- (c) Semiarid
- (d) Subarctic

Specimen 15. Use this specimen for questions 56-59

56. Identify this specimen

57. This mineral is an ore of what metal?

- (a) Aluminum
- (b) Titanium
- (c) Iron
- (d) Copper

58. To which class of minerals does this specimen belong?

- (a) Oxides
- (b) Carbonates
- (c) Sulfides
- (d) Hydroxides

59. Which of these terms best describes its habit?

- (a) Pisolitic
- (b) Oolitic
- (c) Botryoidal
- (d) Globular

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Questions correct: _____

- Questions wrong: _____ $\times \frac{1}{4} =$

Questions skipped: _____

Rank:

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ANSWER SHEET

1. _____

Correct Skipped Incorrect

2. _____

Correct Skipped Incorrect

3. A B C D E

Correct Skipped Incorrect

4. A B C D E

Correct Skipped Incorrect

5. _____

Correct Skipped Incorrect

6. A B C D E

Correct Skipped Incorrect

7. A B C D E

Correct Skipped Incorrect

8. _____

Correct Skipped Incorrect

9. _____

Correct Skipped Incorrect

10. A B C D E

Correct Skipped Incorrect

11. A B C D E

Correct Skipped Incorrect

12. _____

Correct Skipped Incorrect

13. A B C D E

Correct Skipped Incorrect

14. A B C D E

Correct Skipped Incorrect

15. A B C D E

Correct Skipped Incorrect

16. _____

Correct Skipped Incorrect

17. A B C D E

Correct Skipped Incorrect

18. A B C D E

Correct Skipped Incorrect

19. A B C D E

Correct Skipped Incorrect

20. _____

Correct Skipped Incorrect

21. A B C D E

Correct Skipped Incorrect

22. A B C D E

Correct Skipped Incorrect

23. _____

Correct Skipped Incorrect

24. A B C D E

Correct Skipped Incorrect

25. A B C D E

Correct Skipped Incorrect

26. A B C D E

Correct Skipped Incorrect

27. _____

Correct Skipped Incorrect

28. A B C D E

Correct Skipped Incorrect

29. A B C D E

Correct Skipped Incorrect

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30. A B C D E

Correct Skipped Incorrect

31. _____

Correct Skipped Incorrect

32. A B C D E

Correct Skipped Incorrect

33. A B C D E

Correct Skipped Incorrect

34. A B C D E

Correct Skipped Incorrect

35. _____

Correct Skipped Incorrect

36. A B C D E

Correct Skipped Incorrect

37. A B C D E

Correct Skipped Incorrect

38. A B C D E

Correct Skipped Incorrect

39. _____

Correct Skipped Incorrect

40. _____

Correct Skipped Incorrect

41. _____

Correct Skipped Incorrect

42. _____

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43. _____

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44. _____

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45. _____

Correct Skipped Incorrect

46. A B C D E

Correct Skipped Incorrect

47. _____

Correct Skipped Incorrect

48. _____

Correct Skipped Incorrect

49. A B C D E

Correct Skipped Incorrect

50. A B C D E

Correct Skipped Incorrect

51. _____

Correct Skipped Incorrect

52. _____

Correct Skipped Incorrect

53. A B C D E

Correct Skipped Incorrect

54. A B C D E

Correct Skipped Incorrect

55. A B C D E

Correct Skipped Incorrect

56. _____

Correct Skipped Incorrect

57. A B C D E

Correct Skipped Incorrect

58. A B C D E

Correct Skipped Incorrect

59. A B C D E

Correct Skipped Incorrect