

ROCKS AND MINERALS

1. **DESCRIPTION:** Teams will demonstrate their knowledge of rocks and minerals.

A TEAM OF UP TO: 2

APPROXIMATE TIME: 40-50 Minutes

2. **EVENT PARAMETERS:** With the exception of pens or pencils, fingernails, and hand lenses, only those tools provided by the supervisor may be used. Participants may bring **the following items only: one or more writing instruments, a hand lens, one 3-ringed reference binder of any size filled with handwritten, computer-generated, and/or purchased materials, plus one additional book.**
3. **THE COMPETITION:**
 - a. Equal time intervals, as determined by the supervisor, will be allotted for each station. When the start signal is given, participants will begin work at their initial station.
 - b. Participants may not move to the next station until prompted to do so, may not skip stations, or return to any previously visited station.
 - c. Specimens and other materials placed at the various stations may not be taken to other stations.
 - d. HCl will not be provided, nor may it be brought to or be used during the competition. Written descriptions as to how a specimen might react were it to be tested with HCl may be provided.
 - e. Only those specimens appearing on the **Official NSO list (see www.soinc.org)** will be used in the competition with the following exception: Tournament Directors may include up to five additional specimens important to their own state. If additional specimens are to be included, all teams must be notified **no later than three weeks prior to the competition.**

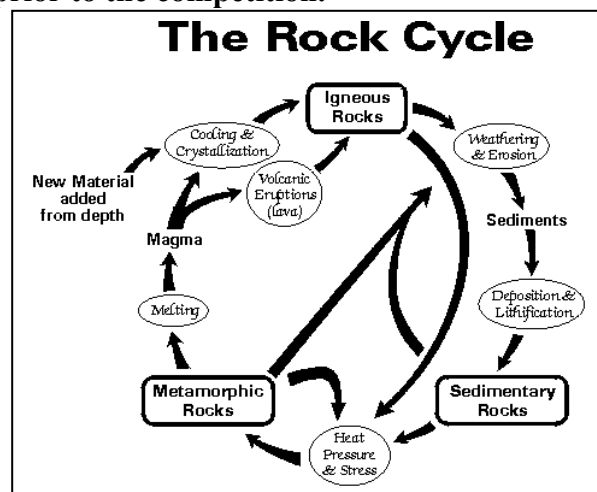
4. **Topics may include, but are not limited to:**

- a. Specimen identification
- b. Rock cycle
- c. Properties of minerals
- d. Mineral groups
- e. Economic importance
- f. Formation and properties of igneous, sedimentary, and metamorphic rocks
- g. Clues to past environments
- h. Composition and structure of minerals
- i. Bowen's reaction series

5. **REPRESENTATIVE STATION ACTIVITIES:**

- a. Using the materials provided, fingernails included, determine the relative hardness of each of these six minerals. List the specimens, by name and number, in order of increasing hardness.
- b. Match each metamorphic rock with the type of rock from which it may have been formed.

6. **SCORING:** Total scores will determine rankings in this event. Ties will be broken by the accuracy or quality of answers to selected questions.



Recommended Resources: See Store at: www.soinc.org to order Science Olympiad Rock & Mineral Teaching Guide & National Audubon Society Field Guide to North American Rocks and Minerals.

Also, **Rocks and Minerals kits** (*excluding only silver, gold, and diamond) may be purchased by check or School Purchase Order from ESES, P.O. Box 503, Lee's Summit, MO 64063 (No Credit Cards or Phone Orders-PH 816-524-5635; FAX 816-525-4263) item OLY01 at \$79.00. Price quoted includes shipping and handling.

Sample exams: http://www.tufts.edu/as/wright_center/products/sci_olympiad/sci_olympiad.html

<http://regentsprep.org/Regents/earthsci/units/rocks/rocks.cfm>

<http://regentsprep.org/Regents/earthsci/units/rocks/minerals.cfm>

<http://bcs.wiley.com/he-bcs/Books?action=chapter&bcsId=2757&itemId=0471697435&chapterId=21544>

National Science Education Standards: Earth and Space Science, Content Standard D: Structure of the Earth System; Earth's History; Earth in the Solar System. (5-8); Earth and Space Science, Content Standard D: Energy in the Earth System; Geochemical cycles. (9-12)

Official Science Olympiad Rock and Mineral List

Minerals

1. Albite [Plagioclase Group]
2. Almandine [Garnet]
3. Amazonite [Microcline]
4. Apatite
5. Aragonite
6. Augite
7. Azurite
8. Bauxite
9. Barite
10. Beryl
11. Biotite [Mica]
12. Bornite
13. Calcite
14. Celestite
15. Chalcopyrite
16. Copper
17. Corundum
18. Diamond*
19. Dolomite
20. Epidote
21. Feldspar [Orthoclase Group]
22. Fluorite
23. Galena
24. Goethite/**Limonite**
25. Gold*
26. Graphite
27. Gypsum [Alabaster]
28. Gypsum [Satin-Spar]
29. Gypsum [Selenite]
30. Halite
31. Hematite
32. Hornblende
33. Kaolinite
34. Lepidolite
35. Magnetite
36. Malachite
37. Muscovite [Mica]
38. Olivine
39. Opal
40. Pyrite
41. Quartz [Agate/Onyx]
42. Quartz [Amethyst]
43. Quartz [Chalcedony]
44. Quartz [Citrine]
45. Quartz [Crystal]
46. Quartz [Jasper]
47. Quartz [Milky]

48. Quartz [Rose]
49. Rhodonite
50. Silver*
51. Sodalite
52. Sphalerite
53. Staurolite
54. Sulfur/Sulphur
55. Talc
56. Topaz
57. Tourmaline Group
58. Tremolite
59. Ulexite

Metamorphic Rocks

60. Gneiss
61. Marble
62. Phyllite
63. Quartzite
64. Schist [Garnet]
65. Schist [Mica]
66. Slate

Igneous

67. Andesite
68. Basalt
69. Diorite
70. Gabbro
71. Granite
72. Obsidian
73. Pegmatite
74. Pumice
75. Rhyolite
76. Scoria

Sedimentary

77. Anthracite Coal
78. Arkose
79. Bituminous Coal
80. Breccia
81. Chert
82. Conglomerate
83. Coquina
84. Diatomite
85. Dolomite Rock or Dolostone
86. Lignite Coal
87. Limestone [Chalk]
88. Limestone [Crystalline]
89. Limestone [Fossiliferous]
90. Limestone [Oolitic]
91. Limestone [Travertine]
92. Sandstone
93. Shale

Trial/Pilot Event

Contact the organizers of your tournament to find out what trial/pilot events will be held.

RECOMMENDED RESOURCES: See Store at: www.soinc.org to order **Science Olympiad Rock & Mineral Teaching Guide & National Audubon Society Field Guide to North American Rocks and Minerals.**

Also, **Rocks and Minerals kits** (*excluding only silver, gold, and diamond) may be purchased by check or School Purchase Order from ESES, P.O. Box 503, Lee's Summit, MO 64063 (No Credit Cards or Phone Orders-PH 816-524-5635; FAX 816-525-4263) item OLY01 at \$79.00. Price quoted includes shipping and handling.

Trial/Pilot Event