

Colorado Science Olympiad
Northern Regional 2000
Rocks & Minerals

School _____ Team # _____
Names: _____ & _____

You will be allotted five minutes at each station. You will not be permitted to return to a previously visited station. Do not rotate to the next station until you have been signaled to do so. The use of resources is permitted.

STATION 1

Match each mineral to its economic use.

1. ____ 2. ____ 3. ____ 4. ____ 5. ____ 6. ____

- A. Sulfuric acid
- B. Drilling mud
- C. Ore for zinc
- D. Artistic stone carving
- E. Pottery and ceramics
- F. Glass
- G. Flux in smelting ores

STATION 2

1. Which specimen does not belong in the same chemical class as the other four? _____
A. Specimen 1 B. Specimen 2 C. Specimen 3 D. Specimen 4 E. Specimen 5
2. To which chemical class do the majority of these minerals belong? _____
A. Halides B. Carbonates C. Oxides D. Sulfides
3. Chalcopyrite includes the element _____ in its composition, but pyrite does not.
A. Copper B. Iron C. Sulfur
4. Which specimen is an ore for lead? _____
A. Specimen 1 B. Specimen 2 C. Specimen 3 D. Specimen 4 E. Specimen 5

STATION 3

1. Sequence these minerals in order of increasing hardness. Record the **numbers** of the specimens. ____ ____ ____ ____ ____
2. What is the name of the soft mineral at this station that has a greasy feel? _____
3. What is the name of the hard mineral whose varieties include sapphires? _____
4. What is the name of the mineral that may exhibit double refraction? _____
5. What is the name of the mineral used in the manufacture of phosphate fertilizers?

STATION 4

1. Identify specimen number 1. _____
2. Identify specimen number 2. _____
3. Identify specimen number 3. _____
4. Sequence these specimens, **by name**, in order of increasing metamorphism.

STATION 5

Determine the specific gravity of this specimen. You **must show your calculations** in the space below.

STATION 6

The composition of igneous rocks may be described with the terms **mafic**, **intermediate** or **felsic**. Study the rocks at this station and complete the table below.

Specimen Number	Name of Specimen	Type of Composition
1		
2		
3		
4		
5		
6		
7		

STATION 7

Match each of the specimens at this station with the type of environment in which it may have formed. Each specimen matches only one of the environments in column two.

- | | |
|----------|----------------------|
| 1. _____ | A. beach |
| 2. _____ | B. river |
| 3. _____ | C. lake |
| 4. _____ | D. swamp |
| 5. _____ | E. near shore marine |
| 6. _____ | F. weathering |
| 7. _____ | G. evaporate |

STATION 8

Match each specimen with its cleavage type:

- | | |
|----------|-----------------|
| 1. _____ | A. Dodecahedral |
| 2. _____ | B. Octahedra |
| 3. _____ | C. Rhombohedral |
| 4. _____ | D. Cubic |
| 5. _____ | E. Prismatic |
| 6. _____ | F. Basal |

STATION 9:

Metamorphic rocks form from other rocks are referred to as parent rocks. Carefully study the specimens at this station and complete the chart below.

Metamorphic Rock Specimen Number	Name of Metamorphic Rock	Parent Rock Specimen Number	Name of Parent Rock
1			
2			
3			

**Colorado Science Olympiad
2000 Northern Regional
Rocks and Mineral Exam Answer Key**

For information on how to obtain a Rocks and Mineral exam including actual labeled specimens plus other coaching aides, you may visit: <http://www.otherworlds-edu.com>.

Note: The names of the [numbered] specimens and other required materials are provided in brackets after each station number.

STATION 1:

[1. Quartz; 2. Fluorite; 3. Sphalerite; 4. Sulfur; 5. Kaolinite; 6. Alabaster]

1. F
2. G
3. C
4. A
5. E
6. D

STATION 2:

[1. Pyrite; 2. Galena; 3. Hematite; 4. Chalcopyrite; 5. Bornite]

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

STATION 3:

[1. Corundum; 2. Calcite; 3. Apatite; 4. Talc; 5. Topaz]

1. 4, 2, 3, 5, 1
2. Talc
3. Corundum
4. Calcite
5. Apatite

STATION 4:

[1. Gneiss; 2. Slate; 3. Schist]

1. Gneiss
2. Slate
3. Schist
4. Slate, Schist, Gneiss [Must appear in this order.]

STATION 5: [1. Galena; spring scale; container of water; string]

$$\text{Specific Gravity} = \frac{\text{Weight of Mineral}}{\text{Weight of mineral [in air]} - \text{Weight of Mineral [in water]}} = \sim 7 - 8$$

STATION 6:

[1. Gabbro; 2. Granite; 3. Obsidian; 4. Rhyolite; 5. Pegmatite; 6. Basalt; 7. Diorite]

1. Gabbro/Mafic
2. Granite Felsic
3. Obsidian/Felsic
4. Rhyolite/Felsic
5. Pegmatite/Felsic
6. Basalt/Mafic
7. Diorite/Intermediate

STATION 7:

[1. Bauxite; 2. Sandstone; 3. Bituminous coal; 4. Conglomerate; 5. Shale; 6. Fossiliferous limestone; 7. Halite]

1. F
2. A
3. D
4. B
5. C
6. E
7. G

STATION 8:

[1. Calcite; 2. Sphalerite; 3. Fluorite; 4. Biotite mica; 5. Amazonite]

1. C
2. A
3. B
4. F
5. E

STATION 9:

[1. Anthracite; 2. Quartzite; 3. Marble; 4. Sandstone; 5. Limestone; 6. Bituminous coal]

1. Anthracite/6/Bituminous Coal
2. Quartzite/4/Sandstone
3. Marble/5/Limestone