Geology Rocks!

Grades: 4,5

Teams Size: 1-2 participants

Duration: 40 minutes

Supervisors: Christine Clark, Lindsay Kolbus

Summary Description:

Participants will be tested on their knowledge of mineral properties, rock types, and basic geologic concepts/processes (Earth's internal structure, volcanoes, earthquakes, plate tectonics, rock cycle including weathering and erosion). Questions will be based on hands-on activities, images, and video clips.

Concepts Covered:

Each group should have knowledge of:

- Earth's Internal Structure – Classification of the layers based on physical and chemical properties.
- Minerals – Definition of a mineral, identification of common minerals using physical properties (luster, color, streak, Mohs' hardness scale, specific gravity, magnetic properties, cleavage/fracture, number of cleavage directions). A reference table will be provided during the test.
- Rocks and rock cycle – Definition of a rock, methods of classification. Identification of common rocks using physical properties (using provided reference table). Classification of rock samples as:
    - igneous (intrusive vs. extrusive),
    - sedimentary (clastic/non-clastic), or
    - metamorphic.

  Know how and where they form, and what processes can change them from one type to another (rock cycle). For metamorphic rocks, be able to discuss what the original rock was.

- Plate Tectonics – Explain what tectonic plates are, how and why they move, processes occurring at plate boundaries (including volcanic activity and earthquakes), different types of plate boundaries. Be able to identify plate boundaries on a Google Earth image using physical features (mountains, trenches), position of volcanoes, and epicenters of earthquakes.

- Volcanoes – Know what a volcano is, how and why volcanoes form, the different types of volcanoes and eruption styles, and their relationship to magma types and Plate Tectonics.
- Earthquakes – Causes, classification (shallow, intermediate, deep; magnitude), epicenter vs. focus, types of seismic waves, relationship to Plate Tectonics. Location of the epicenter using triangulation.

Rules/Competition Format:

Questions will be based upon a wide variety of knowledge including: theory, physical observations/tests, interpretation of images and/or short video clips.

- Questions will be familiar formats: multiple choice, true or false, fill in the blank, short answers, etc.
- A word bank of terms will be available.
- For mineral and rock samples, emphasis is placed on the process of identification, so students may be asked to identify physical properties of samples as well as sample identification.
- Several questions will consist of images or videos.

Scoring:

Highest score wins. Points are awarded for accuracy of responses. Students may reference the spelling of mineral/rock names and terms on the information provided during the test. Spelling should be close enough that it is recognizable.

Tie-Break Criteria:

All students will be asked tie-breaker questions. These will cover more challenging geologic concepts, and/or more accurate observations of mineral/rock characteristics or images. Spelling may also be used for tie-breaking.

Materials Distributed by WESO:

- Mineral kit
- Rock kit
- Physical property ID kit (streak plate, glass plate, copper, nail, magnifying glass)
- Study guide/outline of concepts
- Mineral/rock ID chart

Materials to be brought to competition:

Pencils and a test score sheet will be supplied. Physical property testing materials and ID chart will be provided.

Additional materials/websites useful for practice:

Minerals and Rocks: Minerals for Kids - https://min4kids.org/

Volcanoes: Volcano World - http://volcano.oregonstate.edu/

Earthquakes: Earthquakes - https://earthquake.usgs.gov/learn/kids/

Geoscience concepts: National Park Service - https://www.nps.gov/subjects/geology/geology-concepts.htm

Geology in landscapes: Google Earth - https://www.google.com/earth/

Event Questions

Please go to https://wesoscience.org/events/ for information on how to submit questions about this event to the supervisors.