



See General Rules, Eye Protection & other Policies on [www.soinc.org](http://www.soinc.org) as they apply to every event.

1. **DESCRIPTION:** Teams will demonstrate understanding in the construction and use of topographic maps, geologic maps, and cross sections, and their use in forming interpretations regarding subsurface structures and geohazard risks.

**A TEAM OF UP TO: 2**

**APPROXIMATE TIME: 50 min**

2. **EVENT PARAMETERS:**

- a. Each team may bring one three-ring binder (any size) containing information in any form from any source. The materials must be inserted into the rings (notebook sleeves are permitted).
  - b. Each team should bring a **geologic** compass, protractor, ruler, non-programmable calculator, colored pencils, and an equal-area projection stereonet with tracing paper and pin.
3. **THE COMPETITION:** The event may be composed of a test, stations, or a combination of both that will require the use of knowledge and relevant skills including observing, classifying, measuring, inferring, predicting and using relationships from the following topics:
    - a. Topographic and geologic maps
    - b. Plate tectonics, rock formation, Earth structure, Earth history, lithologies, and geological principles;
    - c. Major structural elements, fold geometries, fault types, erosional patterns, intrusion types, subsurface geometries, and depositional and deformation sequences
    - d. Cross-sections topographic profiles, projections of mapped features, and stereonet projections
    - e. Bed thicknesses, orientations of planes from points, and map projection types
    - f. Geohazards types and methods to assess, monitor, and mitigate the associated risks
    - g. Aquifers, underground fluids, and methods of explorations and production

4. **REPRESENTATIVE TASKS:**

- a. Use a topographic map to construct a topographic profile
- b. Use stratigraphic column, geologic map, topographic profile, strike and dip, and bed thickness measurement to construct a cross-section of sub-surface structures
- c. Determine the order of events based on geological principles
- d. Assess geohazard risks based on interpretation of geologic and topographic maps, knowledge of lithologies, tectonic setting, and seismic history
- e. **Use a geologic compass to take measurements of** strike and dip and plunge and trend of planes and lines
- f. Assess potential occurrence of underground fluids through interpretation of geologic map and cross sections

5. **SCORING:**

- a. All questions will have been assigned a predetermined number of points.
- b. The highest score wins. Pre-identified questions will be used as tiebreakers.

**Recommended Resources:** All reference and training resources including the **GeoLogic Mapping CD (GLCD)** and the **Bio/Earth CD (BECD)** are available on the Official Science Olympiad Store or Website at <http://www.soinc.org>