

1. **DESCRIPTION:** Participants will demonstrate an understanding and knowledge of the geologic characteristics and evolution of the Earth's moon and other rocky bodies of the solar system.

A TEAM OF UP TO: 2

APPROXIMATE TIME: 50 Minutes

2. **EVENT PARAMETERS:**

Each team may bring two 8.5" x 11" sheets of paper that may contain information on both sides in any form and from any source. This information may be used during any part of the event.

3. **THE COMPETITION:**

Part I: Written Test

- a. Participants must be knowledgeable about the history and geologic processes involved in the formation and evolution of Earth's moon and other rocky bodies of the solar system.
- b. Participants may be asked to identify geologic surface features and internal structures of the objects listed below as they appear on diagrams, maps, or images.
 - i. **Dwarf Planets: Pluto, Ceres, Haumea, Makemake, Eris**
 - ii. **Satellites: Earth's Moon, Charon, Mimas, Phoebe**
 - iii. **General Details of Other Small Bodies: Asteroid Belt, Centaurs, Trojans, Trans-Neptunian Objects**
 - iv. **Specific Details of: 'Oumuamua and (225088) 2007 OR₁₀**

Part II: Hands-On/Interpretive Task

- a. Participants will be asked to complete one or more hands-on or interpretive tasks selected from the following topics:
 - i. History of and formation processes for the rocky bodies and their specific features
 - ii. Remote sensing, imagery, and satellite measurements
 - iii. **Missions: New Horizons, Dawn, Cassini, Lucy, Voyager 2**
 - iv. Kepler's laws, gravitational effects of the Moon and tides
 - v. Rotation, libration, phases, and eclipses
 - vi. Surface dating, regolith, volcanism & weathering, cratering & impact processes
 - vii. Internal, surface, and atmospheric compositions
4. **SAMPLE PERFORMANCE TASKS:**
 - a. Given a set of images of a particular feature, identify the specific name of the feature, how old that feature might be, and explain how the feature was formed.
 - b. Describe the internal structure of the object and how this internal structure was determined.
 - c. From a set of images, identify types of eclipses and draw diagrams showing the arrangement of the Sun, Moon, and Earth resulting in each type of eclipse.
5. **SCORING:**
 - a. High score wins. Each task or question will be assigned a predetermined number of points.
 - b. Selected questions will be used to break ties.

Recommended Resources: The Science Olympiad Store (store.soinc.org) carries the Bio/Earth Science CD; other resources are on the event page at soinc.org.

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