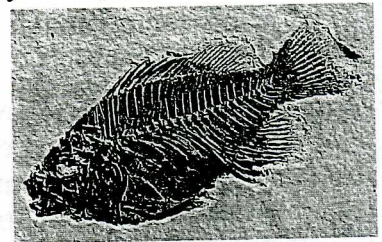


1. **DESCRIPTION:** Teams will demonstrate their knowledge of ancient life by completing selected tasks at a series of stations. Emphasis will be on fossil identification and ability to answer questions about classification, habitat, ecologic relationships, behaviors, **environmental adaptations** and the use of fossils to date and correlate rock units.

A TEAM OF UP TO: 2

APPROXIMATE TIME: 50 minutes

2. **EVENT PARAMETERS:** Each team may bring only one magnifying glass, one published field guide that they may tab and write in, and one 3-ring binder (any size) containing information in any form from any source. The materials must be punched and inserted into the rings (sheet protectors are allowed).
3. **THE COMPETITION:** Emphasis will be placed upon task-oriented activities. Participants will move from station to station, with the length of time at each station predetermined and announced by the event supervisor. Participants may not return to stations, but may change or add information to their original responses while at other stations. **Identification will be limited to species on the Official Fossil List, but other species may be used to illustrate key concepts.** Questions will be chosen from the following topics:
 - a. Identification of all fossil specimens on the official Fossil List posted at <http://www.soinc.org>
 - b. Conditions required for a plant or an animal to become fossilized.
 - c. Common modes of preservation: permineralization, petrification/petrification/silicification, mineral replacement, cast/mold, imprint, actual remains. Uncommon modes of preservation: encasement in amber/copal, mummification, freezing, entrapment in tar/asphalt.
 - d. Relative dating: law of superposition, original horizontality, cross cutting relationships, unconformities (buried erosion surfaces).
 - e. Absolute dating: radiometric dating, half-life, carbon dating, volcanic ash layers.
 - f. Geologic Time Scale
 - g. Index Fossils
 - h. Fossil bearing sedimentary rocks: limestone, shale, sandstone, mudstone, coquina, etc.
 - i. Modes of life: filter feeder, predator, scavenger, deposit feeder, benthic, pelagic, etc.
 - j. Environments: marine, terrestrial, fresh water, etc.
 - k. Mineral and organic components of skeletons, shells, etc: (calcite, aragonite, silica, chitin)
 - l. Taxonomic hierarchy: kingdom, phylum, class, order, family, genus, species
 - m. Adaptations and morphologic features of major fossils groups
 - n. Important paleontological events and discoveries and their significance (e.g., Burgess Shale Permian Extinction, feathered dinosaurs from China)
4. **REPRESENTATIVE STATION TASKS:** Possible questions, tasks, stations and/or examples:
 - a. Identify each fossil and record its mode of preservation.
 - b. **Identify each of the fossils and list them in order from oldest to most recent.**
 - c. Identify each index fossil and record the geologic period(s) **in its stratigraphic range.**
 - d. Based on the fossil and rock associations, determine the environment in which the organism lived.
 - e. Construct a range chart and determine the age of the fossil assemblage.
 - f. **Identify the Genus of a sample trilobite and the type of rock in which the creature is embedded.**
 - g. Identify each dinosaur by name, record each specimen's order **and the geologic periods in its stratigraphic range.**



5. **SCORING:** Points will be awarded for the quality and accuracy of responses. Ties will be broken by the accuracy and/or quality of responses to several pre-identified questions.

Recommended Resources: All reference and training resources including the **Smithsonian Fossil Handbook** and the **Fossil CD** are available on the Official Science Olympiad Store or Website at <http://www.soinc.org>. The Smithsonian Fossil Handbook will serve as the primary authority on stratigraphic ranges of listed specimens, with the **Audubon Society Fossil Field Guide** as the secondary authority.