

AIR TRAJECTORY

Prior to the competition, teams will design, construct, and calibrate a single device capable of launching projectiles onto a target and collect data regarding device parameters and performance.

ANATOMY AND PHYSIOLOGY

Participants will be assessed on their understanding of the anatomy and physiology for the human Cardiovascular, Lymphatic, and Excretory systems.

ASTRONOMY

Teams will demonstrate an understanding of Stellar Evolution: Star Formation & Exoplanets.

CHEM LAB

Teams will complete one or more on-site experiments and answer a series of questions involving the science processes of chemistry focused in the areas of Periodicity and Equilibrium.

CODEBUSTERS

Teams will cryptanalyze and decode encrypted messages using cryptanalysis techniques for historical and modern advanced ciphers.

DETECTOR BUILDING

Teams will build a durable Oxygen Reduction Potential (ORP) or Redox Probe that will accurately measure and display both voltage and the concentrations of NaCl in parts per million (ppm) from 0 to 5000 ppm of different water samples.

DISEASE DETECTIVES

Students will use investigative skills in the scientific study of disease, injury, health and disability in populations or groups of people.

DYNAMIC PLANET

Participants will demonstrate an understanding of the large-scale processes affecting the structure of Earth's crust. (Plate Tectonics, volcanoes, earthquakes)

ECOLOGY

Students will answer questions involving content knowledge and process skills in the area of ecology and adaptations in featured North American biomes. (Tundra, Taiga, and Deciduous Forests)

EXPERIMENTAL DESIGN

This event will determine a team's ability to design, conduct and report the findings of an experiment entirely on-site.

FERMI QUESTIONS

Teams provide answers to a series of "Fermi Questions"; science related questions that seek fast, rough estimates of a quantity, which is either difficult or impossible to measure directly.

FLIGHT

Prior to the tournament, teams will construct, collect data on test flights, analyze and optimize a free flight rubber-powered aircraft to achieve maximum time aloft.

FORENSICS

Given a scenario and some possible suspects, students will perform a series of tests. These tests, along with other evidence or test results, will be used to solve a crime.

FORESTRY

Participants will be assessed on their general forestry knowledge and the trees found in the United States that are on the 2024 Official Science Olympiad National Tree List.

FOSSILS

Teams identify and classify fossils and demonstrate their knowledge of ancient life. Tasks will be related to interpretation of past environments and ecosystems, adaptations, evolutionary relationships, and the use of fossils in dating and correlating rock units.

GEOLOGIC MAPPING

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 past depositional environments on Earth and other planetary bodies.

MICROBE MISSION

Teams will answer questions, solve problems and analyze data pertaining to microbes.

OPTICS

Teams must participate in an activity involving positioning mirrors to direct a laser beam towards a target and are tested on their knowledge of geometric and physical optics.

ROBOT TOUR

Teams design, build, program and test one Robotic Vehicle to navigate a track to reach a target at a set amount of time as accurately and efficiently as possible.

SCRAMBLER

Teams design, build, and test a mechanical device, which uses the energy from a falling mass to transport an egg along a straight track as quickly as possible and stop as close to the center of a Terminal Barrier (TB) without breaking the egg.

TOWER

Teams will design and build a Tower (Structure) meeting requirements specified in these rules to achieve the highest structural efficiency.

WIND POWER

Teams construct a blade assembly device prior to the tournament that is designed to capture wind power and complete a written test on the principles of alternative energy.

WRITE IT DO IT

One student will write a description of an object and how to build it, and then the other student will attempt to construct the object from the description.