

# Kansas Science Olympiad

## 2012 Division C Event Descriptions

**Anatomy & Physiology:** This event encompasses the anatomy and physiology of the muscular, respiratory and endocrine systems.

**Astronomy:** Students will demonstrate an understanding of the basic concepts of mathematics and physics relating to stellar evolution and Type Ia supernovas.

**Chemistry Lab:** Teams will answer a series of questions or complete a task involving the science processes of chemistry focused in the areas of periodicity and oxidation/reduction.

**Disease Detectives:** Students will use their investigative skills in the scientific study of disease, injury, health, and disability in populations or groups of people with a focus on food borne illness.

**Dynamic Planet:** Students will use process skills to complete tasks related to Earth's fresh waters.

**Experimental Design:** This event will determine a team's ability to design, conduct, and report the findings of an experiment actually conducted on site.

**Fermi Questions:** A "Fermi Question" is a science related question that seeks a fast, rough estimate of a quantity, which is either difficult or impossible to measure directly. For example, the question, "How many drops of water are there in Lake Erie?" requires an estimate of the volume of a drop, the volume of Lake Erie from its approximate dimensions and conversion of units to yield an answer. The answers should be an estimate within an order of magnitude recorded in power(s) of ten.

**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:** This event will test student knowledge of North American trees that are on the Official National Tree List.

**Gravity Vehicle:** Teams design, build, and test one vehicle and ramp that uses gravitational potential energy as the vehicle's sole means of propulsion to reach a Target Point as quickly, as accurately, and as close to their predicted time as possible.

**Helicopters:** Teams construct and test free flight rubber-powered helicopters prior to the tournament to achieve maximum flight times.

**Microbe Mission:** Teams will answer questions, solve problems, and analyze data pertaining to microbes.

**Optics:** This event includes activities and questions related to geometric and physical optics.

**Protein Modeling:** Students will use computer visualization and online resources to guide them in constructing physical models of proteins. For the 2012 competitions, students will model proteins involved in regulation of apoptosis as they explore the discovery and treatment of a rare (one in a billion) genetic trait discovered through genome sequencing.

**Remote Sensing:** Participants will use remote sensing imagery, science and math process skills to complete tasks related to an understanding of the Earth's Hydrosphere.

**Robot Arm:** Prior to the competition, teams must design, build, document and test one robotic device to move scoreable items.

**Rocks and Minerals:** Teams will demonstrate their knowledge of rocks and minerals.

**Sounds of Music:** Prior to the competition, each team must build two different instruments, of any type, based on a 12 tone tempered scale, prepare to describe the principles behind their operation and be able to perform a major scale, a required melody and a chosen melody with each.

**Technical Problem Solving:** Teams will be required to gather and process data to solve a given problem. Intermediate measurements and calculations may be required.

**Thermodynamics:** Teams must construct an insulated device prior to the tournament that is designed to retain heat. Students must also complete a written test on thermodynamic concepts.

**Towers:** The objective of this event is to design and build the most efficient Tower meeting the requirements specified in these rules.

**Water Quality:** The event will focus on evaluating aquatic environments.

**Write It Do It:** Technical writing skills are an important part of an engineer's or a scientist's ability to communicate precisely and clearly. This event will test a competitor's ability to effectively communicate with a colleague in writing by having his or her partner construct a device from this written description.