

DESCRIPTION: Students will be asked to identify probable causes of various public health problems and to propose possible strategies to control or prevent those problems. This event combines a basic understanding of biologic and physical agents that cause disease with an ability to analyze, interpret, evaluate and draw conclusions from simple data. Students should be able to distinguish between infectious and non-infectious health burdens.

EVENT PARAMETERS: Non-programmable calculators are permitted, but no reference materials may be used during the competition. References and training resources are available on the CDC website at www.cdc.gov/excite and the Official Science Olympiad Web Page at <http://www.soinc.org>.

A TEAM OF UP TO: 2 **APPROXIMATE TIME: 50 minutes.**

THE COMPETITION:



- Students will be presented with one or more descriptions of public health problems such as an outbreak of food poisoning, a cluster of cases of West Nile encephalitis or state data on bicycle injuries.
- Based on these descriptions, they will be expected to do the following:
 - Generate hypotheses and recognize various fundamental study designs,
 - Evaluate the data by calculating and comparing simple rates and proportions,
 - Identify patterns, trends and possible modes of transmission, sources or risk factors.
 - Propose interventions based on promoting positive health behaviors, eliminating or reducing environmental sources or disrupting clearly identifiable chains of transmission.
- They will also be expected to:
 - Define basic epidemiological and public health terms (e.g., outbreak, epidemic, pandemic, surveillance, risk, vector, fomite, zoonosis, etc.).
 - Recognize various categories of disease-causing agents and give examples of illnesses caused by each.
 - Recognize and understand differences between the major groups of infectious agents (e.g., viruses, bacteria, protists, fungi and animals).
- Calculations and mathematical manipulations should be consistent with middle school math skills and should be part of the competition. Data may be contrived or modified to make it more appropriate for this age group as long as it does not radically alter results or interpretation.
- This event may be run as stations.
- Process skills may include hypothesis, observations, inferences, predictions, variable analysis, data analysis, calculations, and conclusions.

SCORING

- Points will be assigned to the various questions and problems. Both the nature of the questions and scoring rubric should emphasize an understanding that is broad and basic rather than detailed and advanced.
- Depending on the problem, scoring may be based on a combination of answers, including graphs/charts, explanations, analysis, calculations, and closed-ended responses to specific questions.
- Points should be awarded for both quality and accuracy of answers, the quality of supporting reasoning, and the use of proper scientific methods.
- Highest number of points will determine the winner. Selected questions may be used as tiebreakers.