



METEOROLOGY

See General Rules, Eye Protection & other Policies on www.soinc.org as they apply to every event.

1. **DESCRIPTION:** This event emphasizes understanding of basic meteorological principles with emphasis on interpretation and analysis of meteorological data.

A TEAM OF UP TO: 2

APPROXIMATE TIME: 50 Minutes

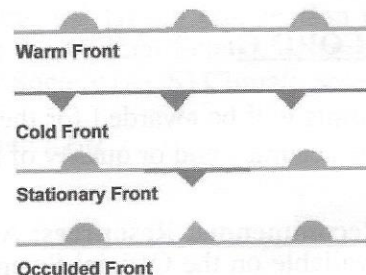
2. **EVENT PARAMETERS:** Each **team** may bring one 8.5" x 11" two-sided page of notes containing information in any form from any source.

3. **THE COMPETITION:** The **tasks** or questions will be from the following **Everyday Weather** topics:

- a. **The modern atmosphere:** structure, thickness, composition, seasonal variation, variable and permanent gasses, unique characteristics, and atmospheric pollutants
- b. **Solar Radiation and Seasons:** energy balance, atmospheric influences on insolation, surface/atmospheric energy transfer processes, diurnal and seasonal temperature patterns, Earth's revolution, rotation, axial tilt, and atmospheric beam depletion
- c. **Water and its properties as they relate to weather:** specific heat, density, sensible and latent heat
- d. **Air Masses:** origin, temperature, density, moisture, advection, and stability
- e. **Atmospheric moisture:** humidity, water vapor, cloud development and forms, precipitation types, formation, and hazards
- f. **Atmospheric pressure:** horizontal and vertical gradients, highs, lows, and fronts (warm, cold, occluded & stationary), ridges and troughs
- g. **Atmospheric circulation:** three-cell model, Coriolis Effect, friction, gradient winds, jet streams, etc.
- h. **Local wind patterns:** Chinook winds, Foehn winds, sea breezes, valley and mountain breezes, Santa Ana winds, Alberta Clippers, panhandle hook, and similar regional weather patterns
- i. **Surface Weather Stations and Surface weather maps:** analysis, construction, and interpretation
- j. **Modern weather instrumentation and technology (use and interpretation):** thermometers, anemometers, barometers, satellite imagery, radiosondes, rawinsondes, Doppler radar, **remote sensing**
- k. **Weather forecasting:** analysis and interpretation of weather maps, meteograms, **stuve diagrams**, isopleths, fronts, Doppler, weather satellites, modeling, **Skew-T log P Diagram**, **thermodynamic charts**, and vertical atmospheric profiles
- l. **Atmospheric phenomena:** sundogs/parhelion, rainbows, aurora, virga, crepuscular rays, green flash
- m. **Temperature indices:** wind chill, heat index, and heating and cooling degree days
- n. **Methods of communicating everyday weather information:**

4. **REPRESENTATIVE ACTIVITIES:**

- a. Determine information about the possibility of precipitation from a **skew-T/log P diagram**
- b. Evaluate how the atmosphere's characteristics may impact air quality at the surface.
- c. Examine a surface weather map of radar, fronts, and data and predict 24-hour weather trends.
- d. Examine surface weather stations on a U.S. Map and interpret local weather conditions.



5. **SCORING:** Points will be awarded for the quality and accuracy of responses, the quality of supporting reasons, and proper use of scientific technique. Highest score wins.

Recommended Resources: All reference and training resources including the **Audubon Weather (Meteorology) Guide** and **Bio/Earth CD** are available on the Official Science Olympiad Store or Website at www.soinc.org Also see: www.education.noaa.gov/Special_Topics/Science_Olympiad.html

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