Tips for Preparing Science Olympiad Participants
For the "Reach for the Stars" Event

A. Additions to the 2004 identification list:
   - Added the variable star, Algol, in Perseus. This is the Arabic adaptation for the "head of the demon" or "demon" star.
   - Added Pegasus, or "The Great Square of Pegasus."
   - Added the Messier Numbers for all required deep sky objects except for the Hyades that is not a Messier object. The French comet hunter, Charles Messier, created this list to help identify objects that frequently "interfered" with his search for comets.

B. Supervisory options for the identification portion of the exam:
   - Planetarium or Portable Starlabs
   - SC001 and SC002 Constellation Charts. Supervisors may provide the coordinates of right ascension and declination and ask participants to locate and identify the objects by name, Messier number, and appearance (photo or image). They may also ask in which constellation the objects are located.
   - Star charts generated by computer programs such as CyberSky or a host of others. A free download copy of CyberSky is available on the web, or you may purchase a copy for $30.00. http://www.fileheaven.com/CyberSky/download/310.htm

C. Tips for preparing participants for Part I
   - To place high in the Reach for the Stars event, participants must do well on this part of the exam, as well as on Part II. Serious participants know these well.
   - If dark, cloudless skies are available, observations made outside are ideal. Participants should begin their observations in early fall. Several trips outside, spaced an hour apart, give participants a feel for the ascent/descent of stars. Encourage participants to view the Pleiades, Orion Nebula, and the Andromeda galaxy through binoculars. The binary stars Mizar and Alcor, located in the handle of the Big Dipper are easily resolved through binoculars.
   - A parent or other responsible adult should supervise participants in areas where safety (strangers) is a concern.
   - Visiting a local planetarium is very helpful also. Participants will experience a different feeling in a planetarium as compared to actual sky observations. When testing in a planetarium, most supervisors provide participants an opportunity to orient themselves to the projected sky before beginning the exam.
   - If you download CyberSky or purchase a different computer program, be sure to set the program for the night before or immediately following the date of each competition. This is especially helpful in identifying which planets are visible on those nights.

D. Part II: Performance tasks integrating content and process skills.
   - Plotting data on line graphs, scatter graphs, and others, plus interpreting data on these graphs, are skills frequently addressed in this event. Identifying cause-and-effect relationships are also crucial to this part of the exam.
   - Developing skill in interpreting concepts illustrated in diagrams and comparing and contrasting photos of planetary objects are also prime skills to master.
   - Entering and interpreting information onto data tables should also be mastered.
   - Developing a basic understanding of Newton's Laws, Kepler's Laws and the inverse square law is also advisable.

E. Strategies for preparing participants for competitions
   - As with other events, don't be too hasty in identifying participants for this event. Provide all interested parties an opportunity to develop an interest in this event.
   - Pair older participants with younger ones. This will pay off in future years and gives the older participant an opportunity to lead.

- Many of the activities presented in the actual event require math and graphing skills.
- Encourage participants to carefully read whatever information the event supervisor has provided on the exam itself. It's highly unlikely that an event supervisor would include information that is not related to the task presented. Those participants who attempt to answer questions and solve problems without first reading the information become lost and waste valuable time.
- Measuring with a high degree of accuracy is extremely important as many of these measurements are the basis for questions and problem solving.
- Participants should be familiar with both the English and metric systems of measurement. Accuracy in measurements are sometimes used as tie-breakers.
- Encourage participants to develop the habit of including units with numerical measurements.
- Some exams are divided into several parts, testing totally different concepts. Encourage participants to scan the exam quickly and tackle the more familiar topics first.
- Students who bring their own rulers, protractors and calculators have an edge on those who rely upon the event supervisors to provide them.
- Participants should be skilled at using right ascension/declination in this event. This skill is transferable to other tasks requiring using coordinates, i.e. H-R Diagrams as an example.
- Place yourself in the event supervisor's position. Constraints presented by room, time, numbers of teams tested per period, time required for grading, etc. help determine the types of activities an event supervisor might choose to do.
- Although event supervisors are encouraged to develop exams incorporating process skills, creative thinking, etc., some supervisors choose to administer pencil-and-paper exams. It is prudent to prepare participants for that type of exam also by encouraging them to read several basic astronomy books.

F. Suggested resources for use in preparing for the "Reach for the Stars" event:

- Many previously administered astronomy exams with answer keys may be found on the Wright Center website: enter the keyword "Wright Center" into your browser and select the Science Olympiad icon in the lower left-hand corner of the home page. If you wish, you may enter the web address: http://www.tufts.edu/as/wright_center/fellows/sci_olympiad/sci_olympiad.html
- Visit http://www.otherworlds-edu.com for a variety of reasonably priced coaching aides. This site offers copies of the Interactive Lesson Guide for Astronomy, by Dr. Michael Zeilik, a University of New Mexico astronomy professor, CDs, etc.
- The Chandra X-ray Observatory website: http://chandra.harvard.edu/edu/ for educational materials on Stellar Evolution.
- Visit: http://www.stellarjourney.net for information about STELLAR JOURNEY: The Game, an outstanding educational game of Stellar Evolution. This site will be available on or about December 15, 2003.
- Browse the library for astronomy books written by noted astronomers published after 1995. Most books published prior to that date are outdated due to the many discoveries made by missions that have flown to the planets plus orbiting observatories such as Chandra, Hubble, etc.
- The first 93 pages of The Audubon Society Field Guide to the Night Sky offers a summary to basic astronomy.