

The Greater Antelope Valley Science Olympiad

A Year-Round STEM Education Engagement Project for K-12 Students and Educators

A Plan for Long Term Sustainability and Longitudinal Assessment of Outcomes and Impact

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Background and History

The Science Olympiad competition started 30 years ago in Michigan as a local event that grew in subsequent years to encompass all states and over 2 million students engaged in various parts of it. On average more than 16,000 K-12 students can claim the title of active Science Olympian every year.

The purpose and mission of the Science Olympiad is described below and quoted directly from the official website (www.soinc.org/about):

Science Olympiad is an international non-profit organization devoted to improving the quality of science education, increasing student interest in science and providing recognition for outstanding achievement in science education by both students and teachers. These goals are accomplished through classroom activities, research, training workshops and the encouragement of intramural, district, regional, state and national tournaments. Science Olympiad tournaments are rigorous academic interscholastic competitions that consist of a series of team events, which students prepare for during the year. These challenging and motivational events are well balanced between the various science disciplines of biology, earth science, chemistry, physics and technology. There is also a balance between events requiring knowledge of science concepts, process skills and science applications. In addition, during the day there are open house activities that consist of science and mathematics demonstrations, activities and career counseling sessions conducted by professors and scientists at the host institution occurring concurrently with the events.

Many states and regions have organized physics, biology or chemistry competitions, but few have combined all disciplines in one large Science Olympiad. The excitement of many students from all science areas competing and cheering one another on to greater learning caused one school district to coin the phrase "intellete". When they searched for a place to house their newly won Science Olympiad State Championship trophy, the only location available was outside the principal's office in the "athlete" showcase, so they convinced the school board to build an "intellete" showcase. One of the goals of the Science Olympiad is to elevate science education and learning to a level of enthusiasm and support that is normally reserved only for varsity sports programs.

In the greater Antelope Valley, the Science Olympiad competition is only three years old, but it has grown by leaps and bounds. In 2014, the event attracted 44 middle school and high school teams from the Greater Los Angeles County area. A total of 600 student Olympians and 78 teachers/coaches participated in the event. At any time between 7:30 am and 4 pm there were approximately 1500 to 1800 people on the camped on the AVC campus. The event is held at the AVC campus centered on the new Health and Sciences building. In 2014, the competition required 46 event supervisors, 64 assistants, and approximately 40 additional volunteers to help with logistics on competition day. AVC faculty, staff, and students provided about 80% of the required personnel. Lockheed Martin, NASA, the AFRL, and private citizens provided the rest of the needed human-power. It is important to mention that the Los Angeles SO office and a team of graduate students from Caltech provided the critically important function of collecting, analyzing, and tabulating the scores to determine the winners.

In 2015 we will expand the competition to include K-6 teams (up to 30 additional teams) that will compete in 20 additional events. This will bring the total anticipated number of students to over 1000. It will also increase the need for additional supervisors and logistical support.

Where are we today?

In its present form, the AV SO competition takes advantage of many of the partnerships that have been developed as part of the overall effort to improve STEM education in the greater AV.

AVC has full logistical control and provides 100% of the necessary funding through the federal STEM grant that was awarded in 2011. The competition requires supervision for 66 different events of various difficulty and needs. All supplies, copies and other materials are purchased by AVC. AVC also provides support for coaches and students by hosting a variety of training sessions both on and off site. For the 2014 competition, nine student assistants were hired to provide training and logistical support to the event. The table below summarizes the estimated cost associated with the event:

Greater Antelope Valley Science Olympiad Cost Analysis					
		2014		2015 (est)	
Activity/Cost Category	Cost Per School	# of schools	Total	# of schools	Total
Registration costs for schools	\$65	30	\$1,950.00	40	\$2,600.00
Supplies/materials	\$400	30	\$ 12,000.00	40	\$ 16,000.00
Student assistants (9 students x 10hrs/week x \$10/hour x 8 weeks)			\$7,200.00		\$7,200.00
Project Director (15% of FT)			\$20,000.00		\$20,000.00
Project Coordinator (40% of FT)			\$25,000.00		\$25,000.00
Training Materials/Supplies			\$5,000.00		\$5,000.00
Cost for Janitorial and other Facility services at AVC (2 days overtime)			\$500.00		\$500.00
Security (LA Sheriff)			Covered by AVC		Covered by AVC
Parking Costs			\$1,000.00		\$1,000.00
Total			\$72,650.00		\$77,300.00

The table above does not include the cost associated with all the volunteers, but it is understood that without volunteers the event would not happen anyway.

The biggest threat to the future of this event is the lack of institutional funding. Currently, the event is funded by a federal grant, but due to the condition of the state budget, AVC is unable to commit the above resources needed to continue the event after the end of the existing grant. In the foreseeable future, the cost of current project director's and

coordinator's positions will continue to be donated by AVC, reducing the overall cost substantially.

Recommendations for Long Term Sustainability

1. AVC will continue to host the event and offer free parking, site preparation and clean up.
2. AVC will volunteer the time for the Director and Coordinator of the project, thus eliminating about 2/3rds of the estimated cost above.
3. An account will be created with the AVC Foundation to solicit contributions from partners and the community in general.
4. MSET will assist in identifying partners that will commit financial and human resources in support of the project. Gold Sponsor-\$5,000; Silver Sponsor-\$2,500; Bronze sponsor-\$1,500, etc.
5. MSET creates an organizing committee (headed by AVC employees) that will:
 - a. Recruit supervisors, assistants and volunteers:
 - i. Each of the sponsors agrees to "adopt" a number of events and be responsible for producing tests, getting supplies, and communicate space needs to the AVC liaisons.
 - ii. If possible, sponsors assist AVC faculty, staff, students with offering additional training opportunities for coaches and students.
 - iii. Each major sponsor will identify an employee who will be the SO liaison and participate in the regular meetings of the SO organizing committee.
 - b. Coordinate training activities with schools.
6. Develop data metrics to track students' performance in school. Among those are:
 - a. How many first time student Olympians return to compete again in another event?
 - b. What are their demographic data (gender, ethnicity, income, etc)?
 - c. How many middle school student Olympians participate in high school Olympic teams?

- d. Track SO student performance as compared to non-SO students.
- e. How many SO students make it to college? In what majors?

(This is not an easy undertaking as it will require the collaboration of elementary, secondary and tertiary education entities to be able to develop the tracking mechanism to answer most of the above questions.)

- 7. Continue the collaboration with the Los Angeles SO and expand the local competition to include more teams from the greater Los Angeles basin. This will raise funds from the registration fees.
- 8. Eliminate or reduce the monetary support for schools if the necessary funds are not raised every year.
- 9. Local school boards recognize the Science Olympiad team as a varsity team not unlike all other sports teams, and provide the necessary funding for coaches and assistant coaches.

It is clear that the future success of the GAV Science Olympiad project depends on the volunteerism of the community and the willingness of all MSET partners to contribute towards the cost of the event. It is also clear, that during the last 15 years, this is the only event that engages k-12 teachers and students in a year round format. While one-day events are important, they alone will not affect systemic and sustainable change either for teachers or for students. The importance of this event cannot be overstated. It is my vision and hope that one day the K-12 Science Olympiad teams will receive the same support and recognition as all other traditional athletic teams.