

Coaching Tips for Science Olympiad Events

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The first question of a new volunteer coach is “What am I getting myself into?” The paper describes some of the responsibilities and options of a Science Olympiad coach.

There are two types of coach. A team coach and an event coach. The team coach is the contact person for the team and mainly keeps track of who the team members are and which of the twenty plus events are being covered by the team. The team coach also **contacts the parents of interested students and works to find an event coach for each event**. This team coach registers the team with the Idaho Science Olympiad.

The event coaches (there should be many for a team) work with the students to prepare for the events. The Science Olympiad has over twenty events, so an event coach will only be coaching one or a few events. Many times, **parent-coaches** will volunteer to handle those events in which they have the most interest or in which their own student is participating. In the past we have seen physicians coach the Disease Detective event, architects the Tower event and engineers the Wind Power event. Not all coaching assignments need to be this well matched, however.

Below is a list of things that the event coach may want to consider. One of the most important things that a coach can do is help the students break up their preparation activities into small manageable chunks with a schedule that has them prepared by the day of the competition. Keep in mind that the students should bear most of the effort in preparing for the event.

- 1) **Read through the event rules thoroughly** with the students and understand the expectations of the event.
- 2) Make a list of the reading and study materials that will be required. There is a tremendous amount of material available at www.soinc.org. Click on B/C Events and follow links to your event. You will find study guides, sample tests and more links.
- 3) Make a list of equipment that will be needed for Lab or Build-it events. Many of the materials can be found in the family home while other materials like a microscope or balance may need to be borrowed.
- 4) Arrange meeting times with the students to get together and practice for the event. In the case of a Built-it event like Towers, this time will be used for construction and calibration. Built-it events are a good opportunity to introduce students to basic hand tools, construction techniques and shop safety. For a Lab event like Write-It-Do-It, a coach can put together sample problems to give the students a feel for competition. When many students are preparing for the same event, the students themselves can pose sample problems for each other, easing the workload on the coach. Paper and pencil events like Ecology require that practice quizzes be composed for the students. The frequency of the meetings can be from every week to every month depending upon the competitiveness of the individuals.
- 5) Insist that each student keep a study notebook to organize and summarize their research and findings.
- 6) The event coaches are not alone in their efforts. The other event coaches are willing to share tips and techniques. Although the students may compete, the coaches collaborate to increase the quality of the competition. Call Gary Carlson, to get in contact with other coaches. Or try the internet at <http://www.soinc.org/> and find the coaches' sections. YouTube has videos of several events. Try a YouTube search with terms like: "Science Olympiad" and "*name-of-your-event*"
- 7) In preparation for many events, the coach can be a good sounding board or devil's advocate. Challenging the students to look at issues and problems from unique perspectives or unconventional angles can help them explore their topic in greater depth. For example, a lab event may ask students to measure and calculate the mass area density of a piece of cardboard. Ask students to try and calculate the area of the cardboard if they already know its area density and mass.
- 8) Finally, some events have more students than there are spots available. In this situation the coach needs to put together an intramural or other way to pick the students to compete in the event. The remaining students might be assigned to another school team or find space in under-represented events.

Coaching the Build-It Events

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A special note about the Build-it projects like Air Trajectory, Bungee Drop, Wind Power, Mission Possible, Tower, Scrambler, and Electric Vehicle:

The Coaches Manual and Rules states: "...adults doing the actual physical work involved (i.e. building a device, rocket, etc) is strictly forbidden"

Coaches for these events should help teach their students about tips and techniques for using tools and various materials. Examples are measuring and marking material to be cut, center punching materials before drilling a hole, using a pilot hole for a screw, choosing the correct saw for the material, and shop safety. The coach should demonstrate the skills on scrap material and then supervise the student's practice attempts. Finally, it will be the student who performs the task upon the actual project workpiece. We do encourage coaches to operate dangerous tools like a table saw once the student has set it up, measured and marked the workpiece.

Other coaches might help with teaching the students about the basics energy and falling masses. In each case the coach teaches and demonstrates skills to be learned by the student. The coach does not dictate a design to the student and then use the student as a technician to build the adult's design.

The skillful coach can be very useful in these events by pointing out basic concepts used in machines of everyday life. Examples include gear reduction of a pencil sharpener, the operation of a mouse trap, or the operation of the car's scissors jack.

Careful questioning of the student can help overcome problems in a design. For example, if your vehicle stops too soon ask "How does your mousetrap affect the duration? Are there different types of mousetraps? How do they differ? What do the other competitors do?" In short, get the student thinking in a larger context.

The coach can find local experts almost anywhere. The local engineer down the street, the retired army officer, and other parents may know a lot. The helpful sales rep at the hobby store may know of an inexpensive component that will just fit the bill for a design. The local hobby shops also know of clubs who have people willing to help the newcomers.

The Build-it projects require materials. Some of the best materials are in toy boxes or second-hand stores. Some events can be built totally from Lego or Erector, or Mechanix sets. More sophisticated designs may require trips to the electronics store or hardware store. Some local companies have lots of scraps. Cabinet shops typically will give away very nice hardwood scraps. Hobby stores sell some excellent experimenter kits that help test out or teach basic electronics or physics concepts.

Encourage students to try more than one design idea if time allows. Test each design and plan on rework and improvements. Seldom does a design work perfectly the first time. Multiple cycles of test and redesign spell the difference between a scud missile and a space shuttle. This concept may be foreign to some students. They are used to doing an assignment once and handing it in. While a first attempt is perfectly acceptable as an entry, the best machines are usually the result of continuous tinkering and improvement. In very popular events, where many students are vying for a place on the first-string team, break the group up into smaller teams with each team working on a different design idea. This builds some healthy competition and increases the overall learning of the team.