

New Jersey Science Olympiad New Coaches Handbook



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All information can be found on the NJ Science Olympiad website:

www.njscienceolympiad.org

Join our Facebook group

<https://www.facebook.com/NJScienceOlympiad>

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The National Science Olympiad Website is:

<http://www.soinc.org/>

National Science Olympiad

Science Olympiad is an international nonprofit 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. The Science Olympiad tournaments are rigorous academic interscholastic competitions that consist of a series of individual and team events which students prepare for during the year. The competitions are akin to an academic track meet. These challenging and motivational events are balanced between the various science disciplines of biology, earth science, chemistry, physics, technology, and engineering. There is also a balance between events requiring knowledge of science facts, concepts, processes, skills, and science applications.

Science Olympiad events are closely aligned with Science Education Standards and include strong components for problem solving, critical thinking and use of technology. Science Olympiad also portrays the close relationship between teaching and assessment. Assessment tasks are developmentally appropriate for students, and include recognition of students' physical skills and cognitive abilities.

New Jersey Science Olympiad

New Jersey Science Olympiad has been on the leading edge of educational innovations since 1993. These innovations include high academic standards; demonstration of skills through performance testing; learning through hands-on, minds-on activities; cooperative learning through events that require teamwork; improved self-concept through success in achieving high standards and making applications and connections to the real world. In 2005 and 2007 New Jersey's own Community Middle School took FIRST place at the National Science Olympiad tournament.

The members of the New Jersey Science Olympiad Committee invite you and your district to participate in Science Olympiad, the foremost academic competition in New Jersey.

How to Participate

- **Division A** – Elementary (Grades 4-6) - Elementary competitions are designed for local school based and regional competitions.
- **Division B** – Middle School (Grades 6-9)- Tournaments are held at the regional, state, and national levels. Each team competes at the regional tournament with top teams moving on to the state tournament. The winning school at the state competition moves to the National tournament.
- **Division C** – High School (Grades 9-12) - Tournaments are held at the regional, state, and national levels. Each team competes at the regional tournament with top teams moving on to the state tournament. The winning school at the state competition moves to the National tournament.

The tournaments last for approximately 7 hours, with an awards ceremony at the end of the competition. Medals are awarded to students who place in each event (1st through 6th place). In addition, teams are awarded an overall placement based on their performance on the individual events and the top 6 teams receive trophies. The winning teams at the State Championship advance to the National Science Olympiad. The competition is intense!

To register a team: There is a registration fee for each team. Visit www.njscienceolympiad.org/registration to complete the online registration form. Once the registration form has been received, an official Rules Manual will be sent while we await your payment. Once payment is received your registration is completed and you will be assigned to a regional tournament. We also offer a second team per school option.

Please read all registration procedures carefully. We have designed this process to be as easy as possible while making it as fair to all teams as possible.

Rules Manual: The same manual is used for regional, state, and national competitions. Each year the events and rules change, so **REVIEW THE RULES CAREFULLY** to avoid penalties due to violations. Often a rule change or clarification is needed. It is important to check both the NJ and National websites to stay up to date on the clarifications or changes. In addition, the rules may need to be modified based on logistics and/or the level of competition. For example, an event may specify a drop height or distance traveled of 5 meters at regional, 10 meters at state and 15 meters at nationals. A host site may not have the facility to accommodate the specified heights and will need to modify the drop height.

Many of the rules in the events are complex. If rules need to be clarified, you can contact a National Science Olympiad Event Supervisor through the official clarifications. As students prepare for an event, keep up to date on all clarifications. Visit the clarification page on our website frequently. At the regional and state tournaments, the judges will receive a copy of the clarifications from the national and state clarifications pages.

Regional Tournaments

Each team will be assigned to a regional tournament held in January. Assignment is based on the order in which the teams complete online registration and the selected regional tournament preferences selected by each team. We do our best to place you in the regional tournament you prefer, however, due to capacity concerns, many schools will not be placed at their 1st choice regional tournament. All schools should plan for attendance at all three regional tournaments.

Regional tournament assignments will be posted to our website a few days after the close of registration. It is not possible for us to tell you what regional you will be placed in prior to that time. Regional tournaments can accommodate a maximum of 20 teams in each division. New Jersey Science Olympiad can enroll a maximum of 120 total teams across all regionals.

Advancing to the State Tournament

The top teams from the regional tournaments will advance to the State Championship. A total of 26 teams will advance from each division. Teams advancing are selected by the New Jersey Science Olympiad steering committee and will be posted to our website 5 days after the last regional tournament of the season is held. Decisions of the committee are final and there is no appeals process.

State Tournament

The state tournament is held in March. There is no additional fee for teams advancing to the State Tournament. In cases where a school has registered two teams for regionals, only one team from the school may advance. The students on the team at the state tournament may be made up of any of the students who participated at a regional from that school.

The Events

Science Olympiad events are designed to use a variety of intellectual and practical skills. Some events require a quick recall of specific facts, while others require concept development, a process skill, or an application of a specific concept. Some events require general knowledge while others require a specific skill. Others may require a student to build an apparatus.

There are 23 events in each division. At regional tournaments, 12-15 events will be announced on our website and held at each regional. At the state tournament all 23 events in each division will be held. Below are some examples:

Anatomy	This event encompasses the anatomy of the muscular and respiratory systems and the effects of aging and diseases on them.
Crime Busters	Given a scenario, a collection of evidence, and possible suspects, students will perform a series of tests. The results along with other evidence will be used to solve a crime.
Helicopters	Teams construct and test free flight rubber-powered helicopters prior to the tournament to achieve maximum flight times.
Junkyard Challenge	Teams must construct a device on-site to solve an engineering challenge.

Regional and State Competition Rules

1. **Team structure:** Each registered team submits the *NJSO Official Team* list of up to 18 team members and alternates to the tournament director prior to the start of the tournament. (This differs from the national rules which allow up to 15 team members.)
2. **Device Impound:** Only regular team members and registered alternates may impound a device. The team member(s) does NOT need to be the student participating in the individual event. Parents, teachers, and others with the team are not allowed to impound.
3. **Scoring Procedures:** Scoring at the regional and state tournaments will follow the same scoring plan at the national competition. Raw scores received from the event supervisor will be converted into a simple number corresponding to their place in that event. (1 = first place; 2 = second place...15 = fifteenth place). These simple scores will be tallied for all events. The team with lowest total score will be receive first place for the state competition.
 - a. If a team makes an honest effort but fails to compete because of outside factors (mechanical failure, etc.), they will receive a simple score equal to N, where N = the total number of teams competing in the tournament.
 - b. Teams that choose not to participate in an event, will receive a score of N+1 for that event.
 - c. Teams that are disqualified from an event (improperly following rules, unsafe practices, severe poor sportsmanship, etc.) will receive a score of N+2.
 - d. There will be no ties; they must be settled through tie breakers at specific events.
4. **Arbitration:** An arbitration committee will be available throughout the day to assist with issues that may arise. Individual event appeal forms will be available from the event supervisors. A team coach must complete the form and submit it to the event supervisor; it will then go to the arbitration committee.
5. **Posting Scores:** Scores will be posted on the NJ website. Scores do not become official for 5 days.

Conduct of Participants

The goal of Science Olympiad is to build character, teamwork, increase the interest of students in science and promote an overall good attitude. Unsportsmanlike conduct will not be tolerated on the part of students, parents, coaches, or guests.

Role of Parents

One of the most important goals of Science Olympiad is that students must be part of team to engage in science and science learning. While it is encouraged that parents and adults help students with their projects and preparation of their events, it is important to stress that parents are there to guide not do it! They should merely be a guide on the side. Having parents construct a structure such as Bridge Building will expose and embarrass the student when they are not capable of answering questions asked of them by the judge. Further, even if the student were to successfully compete, the emphasis of Science Olympiad is NOT to have the student win a medal, but rather to get them involved in the process of science.

Setting up a team

1. Teams consist of 18 students per team, with a coach (teacher or other adult) in charge. **A maximum of 7 seniors are permitted on the Division C team. A maximum of 5 freshmen are allowed on the Division B team.** A school is considered to be a separate school if it has a separate administrator. Students must be from the membership school. Recruiting from neighborhood schools is not permitted. However, middle schools may invite **five of the last year's eighth grade students** to be part of the team. These students are not allowed to be part of the middle school AND the high school team at the same time.
2. Extra students can be designated as alternate participants and may compete in the trial events.
3. For the events, a team may enter no more than **one set of competitors** in any one event.
4. All teams must pre-register to compete in the competition. It is not necessary to name the students who will compete in each event as these names can be changed and listed up to the day of the event.
5. Check the schedule carefully. Do not over commit any one student. In some schools a coach chooses the makeup of the team and this is permissible. Some schools have the science department chooses the team members. In other schools, an intramural competition is used to select certain team members.
6. Schools can use the rules of the Olympiad to run practice activities or mini-competitions if there are multiple students that want to compete in specific events. Consider having several preliminary heats culminating in an assembly format for the entire school to arrive at the best students for the event. These preliminary rounds build interest and suspense for the actual Olympiad.
7. Last minute problems may make it necessary for the coach to move the students into a different event. Be sure to coach students so they can be flexible enough to accept the challenge of a last minute substitutions.

Scheduling Tips

With many events and only 18 team members, scheduling a team to cover every competition can be a difficult task. There are several things to keep in mind when scheduling, which may make your job a little easier.

1. Students with a wider background in a variety of science areas are easier to schedule.
2. The first effort is to schedule a student into his/her “strong” event if this is possible.
3. Note the times and places of events so students will not be covering too much physical ground. If the events are in the same building and back-to-back, the same team members can probably participate.
4. Schedule “back-up” team members to be present in case an event was late in starting or ending and an originally scheduled team member(s) can’t make it. This is not always possible but the coach can ask team members who are “free” to check events during that “free” time to make sure they are covered. This contingency plan is often used.

A student should be encouraged to seek additional sources of information from libraries, college professors or community resource personnel. However, **adults doing the actual physical work involved (i.e., building a trajectory device, rocket, etc.) are strictly forbidden. Commercially finished or purchased products, unless otherwise permitted in the rules, and those completed by adults will be disqualified.**

Hints and Suggestions for New Coaches

1. Goals and Objectives:

- a. Science is Fun
- b. Develop Teamwork

2. Recruiting Coaches:

- a. Hold a parent meeting
- b. Suggest events to parents based upon parent background
- c. Provide school facilities/supplies
- d. Seek help from all staff members, not just teachers
- e. Recruit former team members
- f. Recruit professionals from the community
- g. Check to see if your district requires a Criminal Record Screening for volunteers.

3. Communicating:

- a. E-mail
- b. Submit articles to each edition of the school newspaper
- c. Submit articles to local newspapers with all teams and coaches names along with photos showing training /competition activities

4. Organizing Team:

- a. Accept all who apply for the team or create a tryout.
- b. Identify 18 competing members and alternates as the competition approaches
- c. Provide and enforce written team rules

5. Equipping:

- a. Review materials offered by National Science Olympiad.
- b. Provide materials, safety equipment and supplies needed for each event
- c. Provide resource materials

6. Meetings:

- a. Coordinate schedules
- b. Make food an element of sessions
- c. Get coaches to all offer training sessions and have enough coaches to cover all sessions.
- d. Take advantage of internet resources
- e. Take advantage of resources made available by national (www.soinc.org) and state (www.njscienceolympiad.org) websites.
- f. Combine younger team members with upperclassmen when training for an event
- g. Practice, practice, and more practice is the key. If students are constructing a bridge or a tower, they should actually test it at school, determine what works and what doesn't, and then reconstruct after they have analyzed the results. If students are competing in a lab based event, they should be familiar with all the concepts and should have spent a great deal of time in the lab conducting the experiment. Although many events do not give a specific lab to complete, the rules will specify the general topics that will be tested.
- h. Again, to avoid disqualification make sure students follow the rules carefully and have all safety equipment on the day of the competition.

7. Competing:

- a. Enter all events (this isn't required, but it gives the students more experience).
- b. Remind students to thank the event supervisors and volunteers for each event
- c. Bring parent/staff volunteers to supervise/encourage/comfort students
- d. Take every student who trains to the competition. Enter them in trial events, use them as a cheering section, have them observe other events and keep records/comments
- e. Debrief students about each event as soon as possible and keep records for the future
- f. Bring extra trash bags to clean up areas used for building, eating and recreation.
- g. Don't forget extra supplies for last minute fix-ups: Glue guns, tape, paper, extra goggles.

8. Financing:

- a. Have administration set up an account for the team
- b. Estimate between \$500 - \$1000 for the year
- c. Seek donations from parents and companies/organizations in the community
- d. Encourage donations of equipment and supplies such as team attire, equipment, tools and supplies, parts for construction events, protective glasses/goggles, resource videos or manuals, calculators, food/snacks

Post-Competition Overview

Have a meeting soon after the competition to debrief all that has happened. Have the students record information on the events, the way they were run, and what they could have done differently. Have them discuss their preparations for the events, and how they could have changed their planning to do better. Keep in mind that the goal of Science Olympiad is not solely to win the events. It is to engage in the process of science and become proficient in the methodologies of science. The evaluation of performance is an essential part of learning. Students must focus on what they did, why they did it and how they can improve it.

Here are some things to consider as the students evaluate their performance.

- What events did I do?
- Was I prepared for it?
- Did I have the proper resource if they were allowed?
- Did I spend enough time preparing for it?
- Did I work smart, not just hard?
- If there was a problem, did I communicate it clearly with the judges?
- Did I work well with my team member?
- Did I clearly understand the rules and follow them?
- Were there any rules that were unclear that need to be changed or clarified?
- Was it easy to find the location?
- Did I plan my day well?
- What did I do well and succeed in?
- What positive things occurred during the day?

There are some issues that are beyond the control of the students. As the team discusses the successes during the day, please record any problems that may have existed that can be forwarded to the Tournament and State Directors.

Science Olympiad Web Site and Other Related Resources on the Internet

Many resources sites are available on the Internet. A list of resources is available in this section of the manual. Many of these sites will contain links to several other sites.

www.soinc.org - Science Olympiad has a wide array of materials available to assist with these events. For more information or help on specific events, video tapes, and books go to the national Science Olympiad website

www.njscienceolympiad.org

NJ Science Olympiad is on Facebook!

General Resources (Sites covering multiple topics)

California State University, Northridge — Web Sites & Resources for Teachers - <http://www.sitesforteachers.com>

Chicago Museum of Science & Industry - <http://msichicago.org>

Columbia University-Lesson Plan Gold mine - <http://www.eskimo.com/~billb/amateur/coolsci.html>

Discovery Channel Resources - <http://www.discovery.com>

Eisenhower Clearinghouse (ENC) - <http://www.enc.org>

EnviroLink - <http://www.envirolink.org>

Environmental Protection Agency (EPA) - <http://www.epa.gov>

Exploratorium Index - <http://www.exploratorium.edu/>

Frank Potter's Science Gems, Science and Mathematics Resources - <http://www.martindalecenter.com/>

Hands-on Science Centers Worldwide - <http://www.cs.cmu.edu/afs/cs/usr/mwm/www/sci.html>

Mad Scientist Network —Washington University of Medicine - <http://www.madsci.org/>

Inquiry Institute – Professional Development and Science Olympiad Training - <http://www.inquiryinstitute.org>

National Science Foundation - <http://www.nsf.gov>

National Science Teachers Association (NSTA) - <http://www.nsta.org/>

Oakridge National Laboratory - <http://www.ornl.gov/>

Pacific Bell-Blue Web'n Lesson Plans - <http://www.kn.pacbell.com/>

Science Learning Network - <http://www.sln.org>

Science Resources Search Engine - <http://www.learner.org>

The Global Schoolhouse - <http://www.gsh.org>

US Department of Education - <http://www.ed.gov>

Univ. of Tenn. Computing & Academic Service - <http://oit.utk.edu/>

Yahoo Science-links to each scientific discipline - <http://www.yahoo.com/science>

Biology Resources

Bio-Sciences On-Line - <http://mcb.harvard.edu/BioLinks.html>

Cell & Molecular Biology Online - <http://cellbio.com>

CELLS Alive! - <http://www.cellsalive.net/>

Center for Disease Control - <http://www.cdc.gov/excite/>

Human Genome - <http://www.nhgri.nih.gov/>

National Association of Biology Teachers (NABT) - <http://www.nabt.org>

USGS Biological Resources - <http://biology.usgs.gov/>

Earth and Space Science Resources

Comet Website - <http://www.comet.ucar.edu/>

EE Link (Environmental Resources Link) - <http://eelink.net>

Geophysics - <http://denali.gsfc.nasa.gov>

NASA - <http://www.nasa.gov/>

NSCSS Soil Science Links - <http://www.nscss.org/soil.html>

Project Atmosphere - http://www.ametsoc.org/amsedu/project_atmosphere.html

U.S. Geological Survey — The Learning Web - <http://www.usgs.gov/education>

Volcanoes Page (Michigan Technological University) - <http://www.geo.mtu.edu/volcanoes/>

Water Resources & other science resources - <http://www.ncsu.edu/sciencejunction> Weather

Channel - <http://www.weather.com>

NOAA - <http://www.weather.gov>

Weather Underground - <http://www.wunderground.com/> _

Weather World 2010 Project - [http://ww2010.atmos.uiuc.edu/\(Gh\)/home.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/home.rxml)

Chemistry Resources

Catalyst — links to HS chem resources - <http://www.thecatalyst.org/>

Chemfinder - <http://chemfinder.camsoft.com/>

Exploring ChemCom - <http://www.whfreeman.com/chemcom/>

Interactive Guide to Chemistry - <http://library.thinkquest.org/3659/>

Mad Scientist Network - <http://www.madsci.org/>

Microworlds - <http://www.lbl.gov/MicroWorlds/>

MSDS -Material Safety Data Sheets & Univ. of Kentucky Resources - <http://www.chem.uky.edu/resources>

Periodic Table Information - <http://www.cs.ubc.ca/cgi-bin/nph-pertab>

Water Quality - <http://www.wqa.org>

Water Science for Schools - <http://wwwga.usgs.gov/edu/helptopics.html>

Physics & Physical Science Resources

American Association of Physics Teachers - <http://www.aapt.org/>

Physics Around - <http://www.physics.mcgill.ca/>

Physics Classroom - <http://www.physicsclassroom.com>

Physics Web - <http://physicsweb.org/>