

NSTA Minimum Safety Practices and Regulations for Presenters, Workshop Leaders, Exhibitors, and Advertisers

Preamble

The National Science Teachers Association (NSTA), an organization of science education professionals dedicated to the stimulation, improvement, and coordination of science teaching and learning, supports prudent safety practices and regulations at all levels. Presenters, workshop leaders, contestants, authors at NSTA-sponsored activities, exhibitors, and advertisers serve as role models for other science educators. As role models, these individuals must develop, encourage, and display prudent safety practices at all times based on legal health and safety standards and better professional practices. A model safety role promotes positive safety in actions, words, behavior, and deeds. Science safety is an integral part of science education and serves as a preparation for life. Accordingly, NSTA encourages teachers to offer meaningful and safer science experiences in both the science laboratory/classroom and field. NSTA requires that all presentations, workshops, related science-education activities, exhibits, and advertisements be conducted in accordance with legal health and safety standards/regulations and better professional safety practices. The intent of the following safety guidelines is to promote safer science practices at all NSTA-sponsored activities and exhibits, and in all advertising media as well.

All Presenters, Workshop Leaders, Exhibitors, and Advertisers Must Follow the NSTA Minimum Safety Practices and Regulations

The Following May Not Be Part of Any Presentation or Workshop at an NSTA Conference Under Any Circumstances:

1. Parts of the body are not to be placed in danger, such as placing dry ice in the mouth, dipping hands or fingers into liquid nitrogen or molten lead, or exposing the hands and face to microorganisms. Demonstrations such as the following shall not be conducted: walking on broken glass or hot coals of fire with bare feet, passing an electric current through the body, or lying on a bed of nails and having a concrete block broken over the chest.
2. Live vertebrate animals may not be used in demonstrations or for experimental purposes. Such animals may be used only for observational purposes provided the animals have been lawfully acquired, are housed in proper containers, and are handled in a humane way following the NSTA's "Guidelines for Responsible Use of Animals in the Classroom" (NSTA Position Statement). Any certification papers or vaccination documents shall be made available upon request.
3. Animals are to be used for educational purposes and not for the exploitation of the animal for advertisement, commercial purposes, or sensationalism. This includes use of animals in the Exhibit Hall.
4. Live ammunition, firearms, or acutely dangerous explosives such as benzoyl peroxide, diethyl ether, perchloric acid, picric acid, and sodium azide may not be used. Commercially available fireworks and blasting caps shall never be employed.
5. Plants with poisonous oils (e.g., poison ivy) or saps (e.g., oleander) or other plants known to be generally toxic to humans are not to be used. (Resource: *Human Poisoning from Native and Cultivated Plants*, by James W. Hardin and Jay M. Arena. The publisher is Duke University Press, Durham, NC 27708.)
6. Experiments or demonstrations with human or animal blood/body fluids (other potentially infectious materials [OPIMs]) may not be conducted.
7. Radioactive powders, liquids, or solutions are not to be used except in a laboratory facility designated for the type of radioactive material. Arrange for proper shielding and protection for demonstrations that involve radiation. Only low-level radioactive sources shall be employed. Check with state requirements regarding amounts and kinds of allowable radioactive isotopes.

Guidelines for Preparing Your Presentation:

1. Practice all demonstrations or workshop procedures PRIOR to presenting them to an audience or having participants try them. If participants take part in experiments or demonstrations, be sure to require appropriate personal protective equipment.
2. Research and understand the properties, chemical reactions, and dangers involved in all demonstrations. Access and review the Safety Data Sheets (SDS) for ALL chemicals prior to using them. SDSs for each hazardous chemical must be available at the presentation site. Plan to use correct handling and disposal procedures for all chemicals and biohazards used. Arrange to have a fire extinguisher available whenever the slightest possibility of fire exists. Safety codes require training for use of portable fire extinguishers. Up-to-date training certificates must be provided upon request. Be aware of and inform audience of emergency and fire escape routes for your site.
3. Prepare a handout for each demonstration and hands-on workshop that gives participants detailed instructions about the procedures, safety precautions, hazards, and disposal methods. SDSs for chemicals and biohazards shall be made available at the workshop.
4. All visual technology/media (videos, photographs, posters, slides, etc.) must be reviewed by the presenter prior to the use of the media at any NSTA event. When using visual technology/media in presentations, make sure legal safety standards and better professional practices are illustrated and followed (e.g., splash goggles in dealing with hazardous liquids). Content that does not comply with legal safety standards and better professional practices is not to be used. Also include a discussion of those practices in the visualization prior to or proceeding the viewing. Personal protective equipment (e.g., aprons, gloves, goggles/glasses) shall not be removed for aesthetic considerations.
5. In planning demonstrations and/or workshops, LIMIT quantities of hazardous materials TO THE QUANTITY REQUIRED FOR THE DEMONSTRATION. Use only those quantities that can be adequately handled by the available ventilation system. Do not carry out demonstrations that will result in the release of harmful quantities of noxious gases into the local air supply in the demonstration or other rooms. The following gases shall not be produced without using a fume hood: nitrogen dioxide, sulfur dioxide, and hydrogen sulfide. Volatile toxic substances such as benzene, carbon tetrachloride, and formaldehyde shall not be used. These substances are banned by most chemical lists.

6. Make sure your glassware and equipment are not broken or damaged. The use of chipped or cracked glassware is prohibited. If glassware is to be heated, Pyrex™ or its equivalent shall be used. Properly dispose of broken glassware to prevent exposure to sharps.
7. Thoroughly check motor-driven discs that will be revolved at moderate or high speeds. Make sure the disc is sturdy, that it contains no parts that may come free, and that the safety nut is securely fastened.
8. Arrange to use a safety shield and/or eye protection for audience members and interpreters for any demonstration(s) in which projectiles are launched or when there is the slightest possibility of an unsafe explosion. Do not allow direct viewing of the sun or of infrared or ultraviolet sources.
9. Make sure any lasers to be used in demonstrations are helium-neon lasers with a maximum output power rating not exceeding 1.0 milliwatts. At all times, avoid direct propagation of the laser beam from the laser into the eye of an observer or from a reflected surface into the eye.
10. Secure pressurized gas cylinders by strapping or chaining them in place or by using proper supports, i.e., lecture bottles.
11. Obtain in advance the necessary state and/or local permits needed for the firing of model rockets. Activities involving the firing of rockets must be well planned and follow Federal Aviation Agency (FAA) regulations, state and local rules and regulations, and the National Association of Rocketry's (NAR) Solid Propellant Model Rocketry Safety Code.
12. Make sure all hazardous chemicals used in presentations and activities are labeled in accordance with OSHA's newly revised (March 2012) Hazard Communication Standard 29 CFR 1910.1200 relative to the *Globally Harmonized System of Classification and Labeling of Chemicals* (GHS).
13. Arrange for appropriate waste containers and for the disposal of materials hazardous to the environment.
14. Plan to dress safely for your presentation or workshop.

If you have any questions concerning safety and your presentation, contact Kenneth Roy, NSTA's Chief Science Safety Compliance Consultant (e-mail safesci@sbglobal.net).

During the Presentation:

1. Comply with all local fire and safety rules and regulations. Follow the "NSTA Minimum Safety Practices and Regulations."
2. Wear appropriate personal protective equipment (i.e., eye protection, an apron, ear protection, and similar protective gear) for all chemical demonstrations or when appropriate for other demonstrations. Safety glasses with side shields (ANSI Z87.1 standard) are to be used when dealing with solids (e.g., projectiles, glassware, meter sticks). Indirectly vented chemical splash goggles (ANSI Z87.1 standard) are to be used when dealing with hazardous liquids (e.g., acids, bases, alcohols). Splash goggles (ANSI Z87.1 standard) can also be used in lieu of safety glasses with solids.

For exhibit hall activities, know the location of portable gravity-feed eyewash stations in case of a hazardous chemical splash incident. For all other locations where hazardous chemicals are used, the presenter must provide either a gravity-fed eyewash unit or other type of effective emergency eyewash device.

Provide personal protective equipment such as eye protection, aprons, and safety equipment for participants who will be handling chemicals or hazardous substances, or working with flames. If flames or flammable materials are used, fire suppression equipment must be available and have an up-to-date inspection tag (fire extinguisher). Appropriate personal protective equipment must also be provided for audience members who are considered in the "danger zone" that would result from a splash or other means of contact.
3. Do not select "volunteers" from the audience. Assistants used in demonstrations shall be recruited and given the proper instructions beforehand.
4. Warn participants and the audience to cover their ears whenever a loud controlled explosion is anticipated.
5. Use a safety shield for all demonstrations that involve the launching of projectiles or whenever there is the slightest possibility that a container, its fragments, or its contents could be propelled with sufficient force to cause injury. Shield moving belts attached to motors. Use caution when motor-driven discs are revolved at moderate or high speeds. Shield participants or move them to a safe distance from the plane of the rotating disc.
6. Follow proper procedures for working with pressurized gases and when heating all forms of matter.
7. Use appropriate gloves and shields when working with hazardous chemicals and biohazards, cryogenic materials, hot materials, radioactive substances, vacuums, or electromagnetic radiation, and when presenting animals for observation.
8. Do not taste or encourage participants to taste any non-food substance. A food substance subjected to possible contamination or unsafe conditions shall never be tasted.
9. Alert the audience clearly at the beginning of the program of the presence or production of allergenic materials such as chemical emissions, strobe lights, microwaves, "theater" smoke, lycopodium powder, or live animals.
10. Review emergency evacuation information with attendees at the beginning of the presentation/demonstration/activity. Maintain clear egress during the demonstration or workshop.
11. Emphasize and demonstrate appropriate safety precautions throughout the presentation or workshop.
12. Distribute a handout that will give participants detailed instructions about the procedure, safety precautions, hazards, and disposal for each demonstration and workshop.