

**PSTA MINIMUM SAFETY GUIDELINES  
FOR PRESENTERS AND WORKSHOP LEADERS  
PREAMBLE**

The Pennsylvania Science Teachers Association, an organization of science education professionals dedicated to the stimulation, improvement, and coordination of science teaching and learning, supports scientific safety at all levels. Presenters, workshop leaders, contestants, and authors at PSTA-sponsored activities serve as role models for other science educators. As role models, these individuals must develop, encourage, and display good safety habits at all times. A good safety role model 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, PSTA encourages teachers to offer meaningful and safe science experiences both inside and outside the classroom. PSTA requires that all presentations, workshops, and related science-education activities, be conducted in accordance with recognized safety procedures and good common sense. The intent of the safety guidelines that follow is to promote safe science practices at all PSTA-sponsored activities.

**ALL PRESENTERS AND WORKSHOP LEADERS  
MUST FOLLOW THE PSTA MINIMUM SAFETY GUIDELINES**

**THE FOLLOWING MAY NOT BE PART OF ANY PRESENTATION OR WORKSHOP AT A PSTA CONFERENCE UNDER ANY CIRCUMSTANCES:**

1. Parts of the body are not to be placed in danger, such as placing dry ice in the mouth or 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, and 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. 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.
4. Plants with poisonous oils ( e.g., poison ivy), 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.)
5. Experiments or demonstrations with human blood/body fluids may not be conducted.
6. 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 which involve radiation. Only low-level, radioactive sources shall be employed.

**GUIDELINES FOR PREPARING YOUR PRESENTATION:**

1. Practice all demonstrations or workshop procedures BEFORE presenting them to an audience or having participants try them.
2. Research and understand the properties, chemical reactions, and dangers involved in all demonstrations. 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. Be aware of emergency and fire escape routes for your site.
3. Prepare a handout that gives participants detailed instructions about the procedures, safety precautions, hazards, and disposal methods for each demonstration and workshop. Material Safety Data Sheets (MSDS) for chemicals and biohazards shall be made available upon request.
4. Prepare photographs, slides, videotapes, and so on that show safe science practices. When preparing these materials, safety goggles and equipment shall not be removed for aesthetic considerations.
5. In planning demonstrations and/or workshops, keep quantities of hazardous materials to a minimum. 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 unless a fume hood is available.
6. Make sure your glassware and equipment are not broken or damaged. The use of chipped or cracked glassware shall be avoided. If glassware is to be heated, Pyrex<sup>TM</sup> or its equivalent shall be used.

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, 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 milliwatt. 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 Pennsylvania Association of Rocketry's (NAR) Solid Propellant Model Rocketry Safety Code.
12. Arrange for appropriate waste containers and for the disposal of materials hazardous to the environment.
13. Plan to dress safely for your presentation or workshop. If you have any questions concerning safety and your presentation, contact PSTA Executive Secretary.

**DURING THE PRESENTATION:**

1. Comply with all local fire and safety rules and regulations. Follow the "PSTA Minimum Safety Guidelines."
2. Wear appropriate eye protection, an apron, ear protection, and similar protective gear for all chemical demonstrations or when appropriate for other demonstrations. Provide eye protection, aprons, and safety equipment for participants who will be handling chemicals, hazardous substances, or working with flames.
3. Do not select "volunteers" from the audience. Assistants used in demonstrations shall be recruited and given the proper instructions beforehand.
4. Warn participants or audience to cover their ears whenever a loud 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 or move participants 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, 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 strobe lights, microwaves, "theater" smoke, lycopodium powder, or live animals.
10. 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.

—Adopted by the PSTA Board of Directors, March 1995.