

## **Science Laboratory Safety Manual - 3<sup>rd</sup> Edition**

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The Next Generation Science Standards (NGSS) embrace scientific practices as the behaviors that scientists engage in as they investigate and build models and theories about the natural world. The National Research Council (NRC) uses the term practices instead of a term like “skills” to emphasize that engaging in scientific inquiry requires coordination of both knowledge and skills simultaneously. (<http://www.nextgenscience.org/frequently-asked-questions>) In this way, the vehicle for successful science education is the “doing” of science through engagement via investigations. The embracement of legal safety standards and better professional practices is the bedrock strategy to safer science engagement and investigations!

Science Laboratory Safety Manual (3<sup>rd</sup> edition) is the means by which K- college science teachers, school administrators, science safety facilitators / consultants, school district administrative personnel, school district instructional consultants, CHOs, Safety Officers, college / university personnel and volunteers, and parent(s)/guardian(s), architects and others can help facilitate those safety strategies for safer science investigations. Ultimately, it is science teachers who are responsible for teaching the state/local science standard courses of study and Next Generation Science Standards safely through safer engagement/investigations. Embracing appropriate safety protocols not only make it safer for students and teachers, they also help to keep science teachers and their schools out of harm’s way legally!

All science programs have the potential for safety incidents given the nature of hands-on investigations and demonstrations. In an environment where students are in contact with chemicals, electricity, water, unfamiliar pieces of equipment, open flames, and a variety of biological materials, the potential for an accident is real! These potential hazards can be readily addressed with timely awareness, appropriate assessment and planned action or AAA! Safety and health should be an integral part of the planning, preparation and implementation of any science program. The simple fact is that school laboratories can and must be made safer environments for our students and teachers. This should be accomplished, not simply for the practical and economical reasons of avoiding litigation, but for the moral and ethical obligations to the students we instruct and the staff who instruct them. By developing safety programs and procedures, we serve all these purposes. In doing so we ensure that scientific engagement remains a valuable and fulfilling aspect of the educational experience. This manual was created with those goals in mind. It was developed with the benefit the two nationally and internationally recognized safety specialists with a dedication built on experience and observation within the science education community. The Manual is written with an understanding and familiarity of the legal requirements and nuances vital to the proper administration of any school science program. The purpose of this manual is to provide the guidelines, procedures, and references to help raise the standard of science safety in our nation’s schools and universities. It will help make school laboratories/classrooms the secure and safer environments we are obligated to make them, both for the sake of our students and staff and for the scientific experience itself.

A few reasons why this manual is such a valuable tool for anyone involved with science education:

Over 450 information-packed pages providing the guidelines, procedures, and references needed to raise the standard of school science safety.

- Laws, codes, standards and regulations plus an explanation of liability;
- Thorough explanations about personal protective equipment and its proper use, as well as sources;
- Explanation of the updated EPA, NFPA, OSHA and other legal safety standards;
- Recognizing and addressing common safety hazards by course category;
- What is needed to know to conduct a Laboratory Assessment;
- Better professional practices on a variety of topics;
- Recognizing and addressing fire and electrical hazards;
- Chemical procurement, handling, labeling and storage by appropriate management procedures;
- Chemical and biological hazardous waste disposal;
- First aid reference with details on appropriate procedures;
- Appropriate use of glassware, hardware and equipment;
- Facilities Planner;
- Critical issues addressed – Occupancy Load vs. Class size, contract vs. acknowledgement form, duty of care and teacher liability, etc.
- Appendix containing resources, professional organizations, supply houses and much more.