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# **SAFETY IN IOWA SCIENCE PROGRAMS: A STATUS REPORT**

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## **Introduction**

School science laboratories are active sites of learning. They may also be areas of potential danger from fire, explosives, caustic chemicals, poisons, noxious fumes, and projectiles.

Science teachers are charged with the responsibility of establishing an environment in which students shall have relevant, practical science experiences. In addition, certain segments of the subject matter will require that students develop particular attitudes, knowledge, and skills. Inevitably students will periodically be exposed to potentially dangerous situations.

The courts have held that a teacher is liable for damages only if it can be proven that a teacher has failed to take "reasonable care" or has acted in an illegal manner.<sup>1</sup>

In an effort to increase the science teacher's awareness of potential dangers and responsibilities, the Iowa Department of Public Instruction (DPI) in conjunction with the Iowa Council of Science Supervisors (CS<sup>2</sup>) are developing a safety program for grades 7-12. Utilizing materials and concepts developed primarily by the National Institute For Occupational Safety and Health (NIOSH) and the Council of State Science Supervisors (CS<sup>3</sup>), an in-service program and teacher reference manual is being developed which reflects indigenous Iowa needs.

In the spring of 1978, a twelve-member Iowa safety task force was identified. The task force is composed of teachers, city science supervisors, AEA science supervisors, DPI consultants, and science professors of higher education.

The major goal of the Iowa safety program is to make science laboratories safer, more effective environments in which to learn. This goal will be accomplished through increasing the teachers' knowledge of program safety and emergency procedures and their awareness of potential laboratory hazards.

The safety program and in-service will therefore focus upon safety in the following areas:

Legal Liability of the Science Teacher  
Chemical Handling, Storage, Labeling  
Biological Hazards  
Radiation Hazards  
Physical Plant and Facilities  
Fire Hazards  
Field Experiences  
Lab Hardware and Procedures

### **Guidelines**

The proposed safety program is based upon the following guidelines and beliefs proposed by CS<sup>3</sup>:

1. Instruction in laboratory safety is an integral part of every science program.
2. Although the science teacher has the major responsibility for providing a safe working and learning environment in his/her science facilities, authors, publishers, suppliers of materials and equipment, teacher training institutes, and school administrators and supervisors share in this responsibility and must provide assistance to the science teacher in making science instruction and facilities safe.
3. All science teachers must clearly understand the principles of safe laboratory performance, must be competent to perform safely in the laboratory, and must have a positive attitude toward safety practices and stated safety codes and legal requirements.
4. Safety practices and procedures should not unnecessarily restrict or inhibit the science curriculum, but where activities are hazardous in spite of safety precautions, they must be eliminated.
5. Safety practices learned by students in science laboratories contribute to assuring the students' present and future health and well-being and to that of our society as well.
6. All levels of scientists and science educators should support all programs that will help the science teacher to create and sustain a safe working environment in all laboratories, classrooms, and preparation-storage-project areas.
7. That each science teacher successfully periodically complete a course that relates directly to safety and first aid in science.<sup>2</sup>

## Development Schedule

The proposed development schedule is as follows:

- 1978-79
  - Refinement of NIOSH/CS<sup>3</sup> safety materials by CS<sup>2</sup>/DPI safety task force
  - Development of written facilitators' manual
  - Development of audiovisual materials
  - Pilot materials in select LEA's
- 1979-80
  - Preparation of in-service facilitators — by safety task force (All 15 AEA's, City Science Supervisors, State Private College/University Science Methods Professors)
  - In-service of local science teachers by facilitators
- 1980-81
  - Incorporation of the safety program as component of college science methods courses for future teachers
- 1981-82
  - Evaluation of program effectiveness
  - Program change/update where/when necessary

## Conclusion

The critical role of college and university science and science education departments cannot be over-emphasized. Since new science teachers will be needed in the future, increasing safety awareness through preparation programs seems the most efficient and expeditious manner for accomplishing this task. It is hoped that all institutions (state and private) will participate in the program.

In addition, since each AEA and large city school system in Iowa have unique needs, which are best understood by their science supervisor or curriculum specialist, their involvement as facilitators is essential.

The role of such agencies as the Department of Environmental Quality (DEQ), local fire departments, hospitals, departments of public health, school nurses and administrators as supporting agencies also cannot be over-emphasized.

“It is generally accepted that safety practices are learned and habits are formed by following the models presented by others. Therefore, it is

important that all science teachers and others who may be present in science laboratories understand the implication their safety practices have for students who will learn from them.”<sup>3</sup>

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### Literature Cited

1. Brown, B.W., W.R. Brown. *Science Teaching and the Law*. National Science Teachers Association, Washington, D.C., 1969.
2. Science Laboratory Safety—The Position of the Council of State Science Supervisors. *Working Draft*, July, 1978.
3. *Ibid.*

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### Chemical Storage Plan

Many science instructors are without any recommended plan for storage of hazardous chemicals. A chart, *Recommended Chemical Storage Pattern*, is available free from Chemical Storage Pattern, Flinn Scientific, Inc., P.O. Box 231, Batavia, Illinois 60510.

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### Energy Education Packet

An energy education packet which includes more than 25 simple projects for students about different forms of renewable resources such as wind, water and biomass, plus reading lessons and background supplies is available (\$3.95 ea.) from the Center of Renewable Resources, 1028 Connecticut Avenue N.W., Washington, D.C. 20036.

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### Energy-Environment Source Book

Available from NSTA, this population reference book has been reprinted and twenty pages of new data, tables, and graphs have been added. Price: \$5.00, Stock Number: 471014692.