

# Elementary Science Safety

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## Overview

The following information is intended to point out some specific safety considerations for the elementary school.

Elementary teachers have the opportunity and responsibility to nurture the sense of wonder and excitement that young learners have about themselves, the natural world and learning. Integrate science into every lesson possible. Children learn best by doing and science should be filled with opportunities to explore. Lifelong scientific habits develop through an inquiry-based elementary science program. Just as the foundation for scientific thinking is formed during the early years, this is a very impressionable time in which an awareness of safety should be fostered. Elementary school teachers are role models for students. As such, teachers must adhere to appropriate safety habits at all times and set safety expectations. Safety training is an integral part of learning science and is an excellent way of ensuring that safety becomes a lifelong practice.

- Can collect information by:
  - Observing
  - Taking measurements
  - Analyzing
  - Interpreting
  - Developing reasonable explanations about results

Source: North Carolina Standard Courses of Study.

With each investigation the teacher should weigh the educational benefits against potential risks. It is the science teacher who decides which particular activities are to be student explorations, demonstrations, or omitted entirely. However, teachers must not fall victim to paranoia about safety to the extent that science becomes “arts and crafts” or worksheet driven. **Science concepts and student understanding need to remain the focus not the “arts and crafts.”**

### Types of Science Activities:

- Hands-on lab investigations
- Demonstrations
- Computer simulations



**Utilizing the tenets of this safety manual will assist elementary science teachers with the understandings about safety that must be deployed to the classroom.**



**Always send a BALANCED MESSAGE.**

## EXPECTATIONS FOR K-5 STUDENTS

### Grades K-2:

- Inquire, explore and observe phenomena to specifically stimulate student investigations
- Generate their own questions
- Design ways to answer their own questions by actively doing science
- Follow school and home safety procedures
- Demonstrate safe practices while learning to use and conserve resources and materials

### Grades 3-5:

- Can generate their own questions
- Design ways to find answers on their own

## WAYS TO INCREASE KNOWLEDGE AND UNDERSTANDINGS ABOUT SCIENCE SAFETY

- Familiarizing one's self with this manual.
- Being an active member of your science teachers' association at the local, state, and national level.
- Reading safety articles in teachers' journals.
- Subscribing to listserves which post current information.
- Locating websites for ideas about how other schools, states and professional organizations address science safety.
- Visiting schools which have a school science program and a science safety program in place.
- Learning which local policies/guidelines, if any, relate to laboratory science/safety.
- Taking a safety training course.
- Belonging to your local/state/national science teachers organizations

### CREATING A SCIENCE SAFETY CULTURE

- Having safety equipment prominently displayed and labeled
- Saturating the classroom visually with safety posters and icons
- Managing the classroom through standard operating procedures (SOPs)
- Having the attitude that learning about safety is as important as learning about science
- Including safety in the instructional design (pre-lab, during lab, and post lab)
- Being a safety advocate
- Knowing your students well
- Having students and parents understand and sign “Safety Acknowledgment” forms
- Incorporating safety into teaching is not treated as an “add-on”
- Practicing “What If?” scenarios with students. **See “Laboratory Safety Practice Drills,” pgs 331-339 in the Student Involvement section of this chapter.**

Critical to safety in the K-5 school science classroom is the selection of experiments, materials, resources and field experiences. Thorough planning, careful management and constant monitoring of students’ activities are imperative. Teachers must also be knowledgeable of the properties, possible hazards, and proper use and disposal of all materials used in the classroom/laboratory.

#### There are three vital parts to a laboratory investigation:

- Pre-lab activities
- The laboratory experience
- Post-lab experiences

#### Pre-Lab Activity

- Review SDSs.
- Introduce students to the activity.
- Teach important information about the scientific concept.
- Plan strategies for conducting the investigation successfully and safely.
- Discuss procedures and techniques to be used during the investigation.
- Review safety protocols.
- Conduct experiment/demonstration prior to working with students.

### Safety Protocols (Standard Operating Procedures):

- Housekeeping rules
- Behavior expectations
- Obtain materials from a supply area
- Explain hazards
- Promote a positive attitude – do not want students to be fearful of science
- Review lab procedures, safety rules
- Have a plan in case of an accident
- Monitor students closely
- Institute a progressive discipline policy including removal from laboratory resulting from unsafe practices/ behaviors.

### The Laboratory Experience

- Hands-on portion of the investigation
  - Setting up/performing the experiment
  - Data collection
  - Cleanup
- Students directly participate in activities such as:
  - Analyzing information gathered during the investigation
  - Drawing conclusions
  - Producing graphs, charts, maps, spreadsheets to communicate their findings

### Post-Lab Experience

- Students and teacher discuss conclusions
- Conclusions
- Plan further investigations

### INSTRUCTION AND EXPLORATION

- Teachers are expected to provide appropriate safety instruction before students perform science investigations and experiments.
- While students explore, teachers should continually monitor students and the classroom for unsafe practices and situations.
- Students need to know exactly which behaviors are safe and unsafe as well as the rationale behind safety instruction appropriate to their intellectual and emotional development.

*“Science and Safety-Making the Connection”, Council of State Science Supervisors*