Safe Science: Be Protected!

ELEMENTARY SCIENCE SAFETY
By Dr. Ken Roy

GOOD NEWS - BAD NEWS

Elementary or primary level educators are finally doing more hands-on science over the past decade. General curriculum and instruction has moved once again from memorizing by reading about science to learning by doing science. Science education curriculum and instruction, especially at the elementary level, tends to rise and fall like the ocean tides. Given that the high tide of hands-on science is in, what is the bad news? With the resurrection of students doing science, few elementary educators are prepared safety-wise. What then are some areas which should be addressed for a safer approach to elementary science?

MAKING ELEMENTARY SCIENCE SAFER

How can we help make hands-on elementary science safer for both students and teachers? There is no magic bullet but there are some basic areas of focus. Consider addressing the following safety items to help make the hands-on science experience for students an enriching and rewarding learning experience:

A. Safety training: No matter what level students are at grade-level wise, safety training is crucial. It sets the tone and expectations for appropriate best behaviors. Look at safety protocols for all elementary level science hands-on activities – be it working with soil or using hot water.

B. Acknowledgement form: Share those safety expectations with both the students and parents/guardians with a written acknowledgement form. The acknowledgement form lets the student and parents know hands-on science activities are fun but also need to address safety issues. This differs from a contract which is not legally binding for young students. The acknowledgement form lets the students and parents know there are best practices which must be followed in order to make it safer in the classroom. This protects not only the students but also the teacher from a legal perspective.

C. Reinforcement: Throughout the school year, before each hands-on activity is performed, teachers should review and reinforce safety. It should not be a drive-by experience once a year but an ongoing reinforcement opportunity.

D. Age-appropriate science activities: Make sure hands-on activities are age appropriate for students. Can they developmentally handle both the concepts, content, application and safety behaviors required?

E. Keep it simple and organized: Young students learn the best by making things simple, not complicated. Simplify activities by make providing few steps in the process with reinforced summaries and assessments.

F. Provide appropriate supervision: If possible, try to secure volunteers to work with your students on about a 1:5 ratio. This allows all students to be involved – and to stay involved in the learning experience.

G. School health & safety protocols: Make sure you have reviewed all relevant health and safety protocols required by your school – e.g., evacuation, lock-downs, use of fire extinguishers, etc.

H. Housekeeping: Remember to remove all trip/fall and slip/fall hazards from the work area when doing science activities. This includes things such as back packs, books, clothing, spilled liquids on the floor, etc.

I. Food and drink prohibition: Science work areas should be void of food and drink during any hands-on activities. Once completed, work tables should be washed with soap and water. Floors should be swept and in some cases washed.

J. Personal protective equipment (PPE): Yes – even at the elementary/primary level, there are some types of activities which required PPE! Examples are safety glasses when using solids, projectiles, etc. and indirectly
vented chemical splash goggles when using hazardous liquids – this even includes vinegar or acetic acid solutions. On occasion, hand protection may be required such as gloves, clothing protection, or aprons.

K. **Security:** Make sure all chemicals, equipment, etc. are secured under lock and key. There could be legal issues for teachers if a student takes science materials out of the classroom and gets hurt in the process of using them.

L. **Practice makes perfect:** The teacher should have done the hands-on activity prior to having students doing it. This goes for all activities including commercially prepared kits, journal activities recommended by peers, etc.

M. **Hygiene:** Remember – no matter what the activity, students should wash their hands with soap and water upon completion of the class. This is appropriate whether gloves are used or not.

N. **Equipment:** Be very careful in what equipment is used at the elementary/primary levels – especially if it is hand-me-downs from the middle or high school. Also watch for donated equipment. Heat sources are especially problematic. Under no circumstances should alcohol lamps be used, save the few that are designed with safety in mind. Gas burners are another faux pas. Hot plates under adult supervision may be used. In some cases candles could also be used, again under adult supervision in the upper elementary grades.

O. **Flora and fauna:** Caution must be exercised when bring plants or animals into the elementary classroom. Never bring in animals caught in the wild! They may have disease that could challenge both the health of students and teachers. Be sensitive to students with allergies – especially respiratory. Know your plants – especially those which may be poisonous or toxic.

P. **Blood and body fluids:** Never use any blood or body fluids. This includes cheek cells and blood typing. The risk for blood-borne pathogens is too high!

Q. **Hazardous chemicals:** Make sure you have reviewed the material safety data sheet or safety data sheet in making judgments about chemical use. This includes alcohols and other flammables, indicators, vinegar and other acids, and other chemicals.

R. **Fungi, Molds, Bacteria, Other Microbes:** Given the rise of MRSA in the 1960’s, Strep bacteria, molds, etc., teachers should not involve students with any activities requiring the culturing of microbes. Use preserved slides or bacteria slides made from live yogurt or kefir cultures. Again, the risk is too high, especially with the potential for immune suppressed students on board.

**FINAL THOUGHTS**

In summary, the items listed above are only an outline for making the science experience safer at the elementary level. Make use of peers, professional conferences, publication articles/safety columns and safety training to enhance your effectiveness in the classroom or as an elementary supervisor.

Live Long & Prosper Safely!

By Dr. Ken Roy
Director of Environmental Health & Safety
Glastonbury Public Schools
Safety Compliance Consultant/Officer
NSTA, NSELA
Email: Royk@glastonburyus.org

**RESOURCES**

Elementary Science Classroom (U.S.A.): [http://www.nsta.org/elementaryschool/?lid=hp](http://www.nsta.org/elementaryschool/?lid=hp)