



SCIENCE DISSECTED

Safety in the Science Classroom

Quality science instruction is obtained by having students experience laboratory investigations, demonstrations, and interactive classroom activities. However, each of these instructional methods poses potential for injury or possible litigation. Proper safety techniques will help avoid or reduce the number of these incidences in a science classroom.

Teachers will be prepared to implement productive and safe laboratory investigations once they understand and demonstrate proper lab safety techniques. All science teachers need to be aware of safety and chemical concerns, not only the physical science endorsed teachers. It is important to communicate safety issues with the entire department and inform new teachers of the chemical storage system used at the school. Although the Clark County School District does not endorse any specific vendors, the Southern Nevada Health District and CCSD recommend that schools follow Flinn's high school science chemical storage procedures. In addition to following Flinn's system, the National Institute for Occupational Safety and Health (NIOSH) has a wealth of information in their *School Chemistry Laboratory Safety Guide* to inform teachers of how to maintain a safe laboratory (available online at <http://www.cdc.gov/niosh/docs/2007-107/>).

Most teachers in Southern Nevada are faced with conducting lab investigations in crowded classrooms. Although it may be intimidating to conduct labs under these conditions, students need to *experience* science in order to understand it. Worksheets cannot substitute the experience gained from a lab activity. Due to large classroom sizes, it is imperative that students respect and understand the importance of safety in the science classroom. There are a variety of approaches and activities that can be utilized to teach students lab safety. Many teachers begin their lab safety discussion by using a class period to explain the major rules of the lab followed by having the students and their parents sign a safety contract such as the one provided by Flinn scientific (contract available at http://www.flinnsci.com/Documents/miscPDFs/Safety_Contract.pdf). Teachers can also have their students become artistically creative as they draw lab safety posters illustrating a safe versus an unsafe laboratory environment. On the posters, have the students explain why the conditions meet or do not meet the expectations of a safe lab. Another option is to have the class act out a skit of proper and improper lab conditions (within reason). Additionally, students could be prompted to write a laboratory safety objective/concern as part of their pre-lab assignment. Teachers may opt to build a safety Powerpoint to explain the rules of the lab and include pictures of your class demonstrating proper lab techniques. Although these methods may be effective for explaining the laboratory safety rules, it is not enough to ensure that safe lab experiences will be maintained throughout the year.

Despite the method used to introduce safety in the science classroom, it is essential that teachers reinforce the rules throughout the school year. In fact, each lab day, teachers should remind their students of proper safety techniques. Teachers also need to record in their lesson plans that they reviewed lab safety rules with the class. Recalling the rules and demonstrating proper lab techniques will minimize unnecessary problems by encouraging students to act appropriately. If you teach a large class, you may consider splitting the class in half and have one group participate in the lab while the other half of the class focuses on a seated assignment. The next day, the class would reverse roles. Although nothing can be done to guarantee an accident-free lab experience, reinforcing the rules and closely monitoring the class will provide a safer environment for all.

Related Safety Resources:

Science TIPS NOS Safety Benchmark, http://rpd.net/sciencetips_r2/N12A4.htm

Flinn Safety Resources, <http://flinnsci.com/Sections/Safety/safety.asp>

Archived Issues of Science Dissected, <http://www.rpd.net/link.news.php?type=sciencedis>

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Safety in the Science Classroom continued...

Top 10 Science Safety Rules for Teachers and Students

Teachers

Prepare students to have a positive attitude toward safety in the science classroom and to take it seriously. Do not scare them, but make them respect the hazards of the lab.

Be a role-model and practice proper safety techniques at all times. If the class is required to wear goggles, so should the teacher.

Try the lab before your students complete the lab. As you work through the lab, consider possible areas of error or safety concerns. You may also realize areas of the lab that need modifications.

Use common sense when having students “clean up their own mess.” If the substance poses a danger to the student and their classmates, take on the responsibility of the proper clean up.

If your class sizes are very large, consider breaking up the lab into a two-day experience. Have half the class engaged in seat work while the others utilize the laboratory work space. The following day, the class would exchange assignments.

Demonstrate proper lab techniques to your students before they attempt a lab investigation. Always model safe and appropriate techniques.

Never allow students in the science storeroom unsupervised. Sometimes, the smartest students are the ones who know too much and can get in trouble.

Read the Materials Safety Data Sheets (MSDS) and be prepared to take action if an accident occurs.

Report all accidents to the school nurse and complete an incident form. Always contact the parents if an injury occurs.

Circulate and monitor your class to maintain a positive, productive, and safe learning environment.

Students

Read all directions carefully. If you don't understand them, read them twice. If you still don't understand, then ask your teacher.

Only perform the experiments outlined by the teacher. **DO NOT** investigate on your own without permission.

Ensure proper eyewear is worn by all individuals who are performing the lab *and* supervising.

Report any accidents to the teacher, immediately.

Never eat or drink in the laboratory.

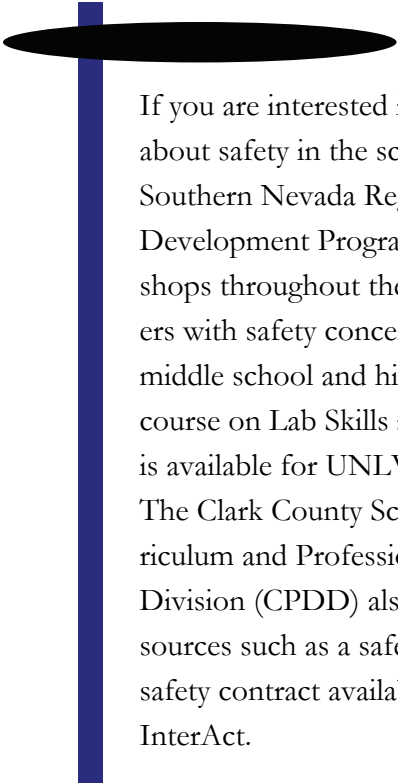
Keep backpacks, purses, and all personal items off of the workbench. Also, keep the walkways of the classroom clear.

Tie back long hair.

Do not wear baggy or dressy clothing on lab days.

Avoid any mischief or horseplay during a lab.

If you have to think about if your actions are appropriate or not, **DO NOT DO IT!**



If you are interested in learning more about safety in the science classroom, the Southern Nevada Regional Professional Development Program offers a workshops throughout the year to assist teachers with safety concerns. There is also a middle school and high school level course on Lab Skills and Processes which is available for UNLV credit. The Clark County School District's Curriculum and Professional Development Division (CPDD) also has numerous resources such as a safety quiz and a student safety contract available at their link on InterAct.