

Safety in the Science Classroom

Integrated Coordinated Science for the 21st Century has been designed to engage students in authentic inquiry. It therefore includes hands-on activities and laboratory investigations. But as the study of science moves from the classroom to the laboratory, issues of safety can increase. No one individual can anticipate all safety issues, but some basic safety guidelines should help teachers prevent most problems.

Of primary concern in safety is preparation. Do your students know what to do in case of an emergency? Take the time to instruct your students on basic safety precautions. Most schools have formalized evacuation procedures. Make sure your students are aware of these procedures. Fire extinguishers are also standard in most science lab settings. Students should be aware of the location of the fire extinguisher and be instructed in its proper use.

Adequate preparation also necessitates communicating a variety of safety guidelines to the students. Such rules help clarify teacher expectations with respect to safety. They specify what types of behaviors are not allowed and what behaviors are required. The following pages list Safety Guidelines for five aspects of the science classroom:

- General Rules
- Equipment Rules
- Working with Chemicals
- Flame Safety
- Work Area

Duplicate these pages and go over the safety rules with your students. After reading the guidelines, students and their parents must sign the Safety Contract that follows. By signing the contract, students are acknowledging that they have read and understood the rules and will follow them at all times.

In addition to increased preparation, safety in the inquiry-based, science classroom often necessitates increased supervision. Your students will often be working in groups and will be more active than sedentary. Furthermore, the level of teacher supervision will need to match the potential danger of the activity.

It is also necessary to provide a variety of materials to promote safety in the inquiry-based science classroom. Standard protective equipment for the students should include: eye protection, gloves, aprons, and of course a first-aid kit. Proper storage of any chemicals and other hazardous materials is also critical. Keeping these overall safety considerations in mind will help you create the safest environment for you and your students.

In addition to these overarching safety considerations, you will find *General Safety Concerns* in the Overview information for each chapter. Review these concerns with students prior to starting the chapter. *Specific Safety Concerns* are also provided in the teacher notes for each activity in which particular safety issues are present. Make sure students fully understand these issues before beginning the activity.

Safety Guidelines

During this course, you will be doing many activities in which safety is a factor. To ensure the safety of you and all students, the following safety rules will be followed. You will be responsible for abiding by these rules at all times. After reading the rules, you and a parent or guardian must sign a safety contract acknowledging that you have read and understood the rules and will follow them at all times.

General Rules

1. There will be no running, jumping, pushing, or other behavior considered inappropriate in the science laboratory. You must behave in an orderly and responsible way at all times.
2. Eating, drinking, chewing gum, or applying cosmetics is strictly prohibited.
3. All spills and accidents must be reported to your teacher immediately.
4. You must follow all directions carefully and use only materials and equipment provided by your teacher. Only activities approved by your teacher may be carried out in the chemistry laboratory.
5. No loose, hanging clothing is allowed in the laboratory; long sleeves must be rolled up; bulky jackets, as well as jewelry, must be removed.
6. Never work in the lab unless your teacher or an approved substitute is present.
7. Identify and know the location of a fire extinguisher, fire blanket, emergency shower, eyewash, gas and water shut-offs, and telephone.

Equipment Rules

1. All equipment must be checked out and returned properly.
2. Do not touch any equipment until you are instructed to do so.
3. Do not use glassware that is broken or cracked. Alert your teacher to any glassware that is broken or cracked.
4. Use caution with all sharp instruments like scissors. Always work with the sharp points and edges pointed away from yourself.

Working with Chemicals

1. Never touch or smell chemical unless specifically instructed to do so by your teacher. Never taste chemicals.
2. Never taste any water samples involved in any experiment.
3. Safety goggles must be worn at all times.
4. Carefully read all labels to make sure you are using the correct chemicals and use only the amount of chemicals instructed by your teacher.
5. Keep your hands away from your face and thoroughly wash with soap and water before exiting the classroom.
6. Contact lenses can absorb certain chemicals. Advise your teacher if you wear contact lenses.
7. Never add water to an acid and always add acid slowly to water.

8. Follow your teachers' instructions for the correct disposal of chemicals. Do not dispose of any chemical waste, including paper towels used for chemical spills, in the trash basket or down a sink drain.

Flame Safety

1. Use extreme caution when using any type of flame. Keep your hands, hair, and clothing away from flames.
2. Long hair must be tied back at all times.
3. Keep all flammable materials away from open flames. Some winter jackets are extremely flammable and should be removed before entering the laboratory.
4. Always point the mouth of a test tube away from yourself or any other person when heating a substance.
5. Extinguish the flame as soon as you are finished.
6. Always use heat-resistant gloves when working with an open flame.

Work Area

1. When working in the laboratory, all materials should be removed from the workstation except for instructions and data tables. Materials should not be removed from the desktop to the floor as this is a hazard for someone walking with glassware or chemicals.
2. The work area should be kept clean at all times. After completing an activity, wipe down the area.
3. Notify your teacher of any spills immediately so they can be properly taken care of.

Safety Contract

The following contract may be reproduced and must be signed by each student and a parent or guardian before participating in laboratory activities.

I have read **Safety Guidelines** and understand the requirements fully. I recognize that there are risks associated with any chemistry activity and acknowledge my responsibility in minimizing these risks by abiding by the safety rules at all times.

Please list any known medical conditions or allergies:

I **do** / **do not** wear contact lenses. (Circle one)

Emergency phone contact _____

Student signature _____ Date _____

Parent or guardian _____ Date _____

Teacher _____ Date _____