Cobb County School District Science

Safety Handbook

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Rational

The purpose of the Science Safety Handbook is to provide instructors with information that will minimize the opportunity for incidents or injuries in the science laboratory. Familiarity with the lab procedures, proper equipment selection, location, & training are requirements that assist in creating a safe environment for students in the laboratory.

I. Professional Expectations

It is a professional expectation that science teachers will take all reasonable actions to help prevent accidents or incidents from happening. School administrators and science teachers should work together to help make the science laboratory a safe place for students.

II. What are my responsibilities as a science teacher?

Risk management, instruction, supervision, and laboratory maintenance are all important responsibilities of a science teacher. The below guidelines describe best practices for maintaining a safe laboratory environment.

A. Risk Management

- Explain safety procedures and practices to students
- Instruct and model safety procedures
- Warn students of hazards before starting a lab
- Inspect lab equipment for safety
- Conduct a lab yourself before letting students perform a lab
- Enforce safety regulations/behavioral consequences
- Maintain Personal Protective Equipment (PPE)
- Use smaller volumes of chemicals

B. Instruction

Adequate instruction before a laboratory activity helps to minimize risk. This activity should be documented in writing either in a lesson plan or on materials given to the students before the activity.

This instruction should:

- Be accurate, appropriate to the situation, setting, and maturity of the audience;
- Address dangers.
- Identify and clarify specific risks involved,
- Explain proper procedures/techniques to be used
- Present comments concerning appropriate/inappropriate conduct in the lab. (See Appendix A).

- Follow professional and district guidelines. Set a safety example for students by following proper laboratory procedures.

C. Supervision

Points to remember:

- Misbehavior of any type is unacceptable in the laboratory environment
- The greater the degree of danger, the higher the level of supervision should be.
- Students' age, maturity and capacity are all important factors in assessing appropriate level of supervision.
- Students should not be left unattended. A balancing of potential harm versus risk to students may be necessary in an emergency.
- Refer to Appendix B, Risk Vs. Reward Chart for Labs

D. Laboratory Maintenance

- Do not use defective equipment.
- File written reports for maintenance/corrections of hazardous conditions or defective equipment with responsible administrators.
- Establish regular inspection schedules and procedures for checking safety and first-aid equipment.
- Follow all safety guidelines concerning proper labeling, storage, handling, and disposal of chemicals.

III. Communication Plan

In the event of an accident or injury, teachers should follow these procedures:

1. **Contact an administrator immediately.** Use the emergency call button, send another teacher, or, as a last resort, send a student. Make sure to provide the pertinent information regarding the incident (what happened and to whom).

2. **Contact the appropriate emergency services.** Consult with an administrator and/or school risk assessment team to make the decision to call 911 or any other emergency service. If the event is a hazardous spill, provide the responders with MSDS (Material Safety Data Sheet) information about the contents of the spill and any chemicals in the area of the spill. Identical, updated MSDS folders should be located in a chemical storage area and your school's front office.

3. **Write up an incident report.** Immediately following the incident, complete an incident report.

Suggested Emergency Procedures

In all cases, an administrator should be contacted and an incident report filed

Injury	Response
Burns	Flush with water for at least 5 minutes.
Minor Cuts	Flush with water; pat dry; cover as necessary.
Fainting of Collapse	Check airway, breathing, circulation. Call nurse and proceed with AED. Provide the person with fresh air. Have a person recline so that their head is lower than the body.
Fire	If fire occurs on lab table or immediate areas, smother with towel or blanket. Use fire extinguisher immediately.
Foreign Matter in Eye	Flush eye with plenty of water for a minimum of 15 minutes. Use a free flowing water source. If unable to flush object out, protect the eye and seek prompt medical attention.
Poisoning	Call poison control and/or 911 and follow their direction. Note the suspected poisoning agent.
Severe Bleeding	Call Nurse. Apply pressure of a compress directly to the wound with a clean cloth for 5 minutes. If more cloth is required, do not remove saturated cloth. Elevate above the heart.
Acid Spill on Table of Floor	Contain spill (use cat litter or sand) then neutralize with appropriate kit or baking soda.
Acid and Base Spills on Body	Contact school nurse. Flush with water or use safety shower for at least 5 minutes.
Base Spill of Table or Floor	Contain spill (use cat litter or sand) then neutralize with appropriate kit or boric acid
Ingestion of Acid/Base	Contact poison control.

IV. Other Things to Consider

The following are some simple suggestions that will help keep you and your students safe:

1. **Use common sense**. Many incidents occur due to lack of planning or communication. Take the time to know what you are doing and what you should expect from the activity. This will cut down on the potential for accidents to occur.
2. Safety should be discussed and documented for every laboratory/activity you have your students conduct. Make every effort to anticipate the mistakes your students could make that could potentially harm them. Discuss these possibilities with your students.
3. Students should use safety goggles for every lab involving chemicals, projectiles, heat and glassware . Goggles are to be cleaned and sanitized after each use. They should fit over eyeglasses. Everyone in the classroom should wear goggles including YOU!
4. Maintain your lab inventory. You are responsible for knowing what chemicals and equipment you have and ensuring they are stored appropriately and returned to the correct storage area after use.
5. You should be present in the classroom when lab equipment is being used that could potentially be removed by students (i.e. scales, glassware, chemicals). When not in use, equipment and chemicals should be in a secured location inaccessible to students.
6. Do not transport chemicals in the hallways when students are present. Do not allow students to transport chemicals without direct supervision by yourself or another qualified teacher. Do not allow students to access stock rooms without direct supervision.
7. Do not allow students to handle concentrated acids and bases.
8. *If you cannot determine the level of risk of a laboratory, it should not be conducted*. (See Appendix B) Know the potential dangers of the chemicals and equipment you are asking your students to work with.
9. Maintain proper hygiene techniques. The use of nitrile gloves and resistant lab aprons is recommended. Have students wash their hands with soap after each laboratory activity.
10. No food, drinks or gum in the lab!
11. Use appropriate sterilization techniques. Sterilize using 10% bleach solution, or Lysol your biological equipment.
12. Do not culture indigenous bacteria or mold. Do not conduct labs that use authentic bodily fluids.
13. Live animals in the classroom require the prior approval of your school's principal.
14. Follow proper storage and disposal techniques. Contact your department chairperson for more specific information. Individual school storage and disposal protocols may be different.

Appendix A: Communicating Safety Rules and Procedures to Students

1. **Provide Safety Contract**
    A. Sectioned by content areas
    B. Parent signature

2. **Beginning-of-Year Interactive Safety Rules and Procedures Lessons**
    A. Interactive and student led activity
        1. Drama collaboration
        2. Competition
        3. Fun video
        4. Review case studies
        5. Locate images revealing errors in lab safety and answer, “What would happen if...”

3. **Pre-lab Safety Instruction**
    A. Lab-specific discussion
        1. Review lab procedures
        2. Discuss potential safety concerns
        3. Teach students how to use equipment or chemicals
        4. Share behavior expectations

Appendix B- Risk Vs. Reward Chart for Labs

One way to help maintain a safe lab environment for teachers and students is for the teacher to consider the risk versus reward of the different labs they choose to conduct in their classroom. A teacher should consider every risk present in a lab to both the teacher and the students. If the risk is deemed too high for the reward, the teacher should find an alternative lab or consider virtual labs or demonstrations that could be done in place of the high-risk lab.

Create a list of the risks and rewards that your lab would provide. Evaluate your list and make any adjustments to your lab to minimize risks.

Risk	Reward

Adjustments to Minimize Risks:

Cobb County School Science Safety: Laboratory Safety Checklist

School _____ Room ____Teacher_____

General Safety Topics	Yes	No	Notes
Does the Science Department adhere to the Cobb County Lab Safety Handbook designed to minimize risks in the lab?			
Are staff and students trained in lab safety procedures? (Annual training held by Department Heads and Subject Coordinators)			
Is a signed Cobb County lab safety contract on file for every student/parent?			
Are a set of safety rules clearly displayed?			
Is food or drink prohibited in the lab?			
Are accidents and incidents reported and recorded?			
Are floors kept clean and free from slip/trip hazards?			
Have emergency procedures been practiced by students and staff during the current school year?			
Safety Equipment			
Are safety goggles properly sanitized between uses?			
Is lab equipment inspected before each use?			
Are lab showers and eyewashes inspected monthly?			
Are fume hoods functioning properly in the lab?			
Chemical Safety			
Are the fume hoods clean and ready for use (no storage of chemicals)?			
Is there an up-to-date inventory of all chemicals stored and used in the labs?			

Are material safety data sheets (MSDS) for each chemical available near where the chemicals are stored?			
Are MSDS available in the front office?			
Do all staff and students who use chemicals wear appropriate personal protective equipment?			
Biological Safety			
Are procedures regarding use of sharp equipment (needles, scalpels, syringes, etc.) reviewed with students to minimize the risks of cuts?			
Are disposable gloves readily available for the handling of specimens?			
Chemical Storage			
Are chemical storerooms properly secured (locked) with access denied to students?			
Are incompatible chemicals properly separated from each other?			
Are corrosive chemicals (such as acids and bases) stored in separate & appropriate storage cabinets?			
Are flammable liquids stored in a flammable liquid storage cabinet?			
Are reactive chemicals (e.g. phosphorus, alkali metals) covered with sufficient immersion fluids?			
Are all chemical containers clearly labeled?			
Are there appropriate materials for dealing with chemical spills?			
Is the quantity of each chemical stored kept to a practical minimum?			
Are chemical wastes properly separated and stored?			

Science Teacher Signature_____ Date_____

Department Head/Subject Coordinator Signature_____ Date_____

Cobb County Middle School/High School Science Department
Student Safety Contract

I, _____, recognize that it is my responsibility to conduct myself in a responsible manner at all times to help create a safe science laboratory environment. I agree to assume responsibility for my own safety and for the safety of my classmates. I agree to follow the safety guidelines set forth in the laboratory procedures and to follow the teacher's instructions at all times. In addition, I will abide by the following safety rules:

- I will not bring food and/or beverages into the laboratory area
- On lab days, I will wear appropriate clothing, which includes shoes that cover the entire foot and natural fabric material that covers the body from the shoulders to the ankles. My clothing will not have rips and tears that expose the skin.
- I will wear safety goggles when required.
- I will handle all laboratory equipment as instructed.
- I will familiarize myself with laboratory techniques involved in each activity before I attempt to perform the activity.
- I will learn the location and proper use of the safety equipment and first aid in the laboratory.
- I will report any accident to the teacher immediately and know where to get help if needed.
- I will familiarize myself with the procedures to be followed in case of fire in the laboratory.
- I will keep my work station clean and organized.
- After each activity has been completed, I will dispose of all chemicals according to the teacher's directions, and I will return all materials and equipment to their proper places.
- I will follow any additional instructions, written and/or verbal, provided by the teacher.

I agree to:

-respect the teacher and my classmates by not interfering with the learning process
-use all equipment with care and report broken or damaged equipment immediately
-follow the written directions and the teacher's verbal instructions as to the correct use of equipment.

I understand that the equipment I use must be returned in good condition. I understand that payment will be required for any equipment I break and that I will not be allowed to participate in the laboratory activity, and may be subject to appropriate student discipline if I do not follow the safety rules listed above.

_____ _____

Student signature Date

Parent Support
Syllabus/Course Policy, Lab-Safety, and Equipment-Use Agreement
Please read carefully before signing below.

The Cobb County Science Department offers a hands-on approach to learning science. Inquiry-based activities and labs are a part of every science course. Students are expected to use the laboratory equipment appropriately and with care. All equipment must be used in a way that is consistent with either written or verbal instructions. It is expected that the equipment will be returned in the same condition it was issued. If the equipment is broken due to student negligence, such as not following directions, unauthorized experimentation, inattentiveness or horseplay, the student will be required to pay the replacement cost of the equipment.

I have read and discussed with my student the safety rules and the equipment use expectations. My student and I understand that violation of these rules may put him/her and other students in harm's way. For this reason disciplinary action to include suspension of lab privileges could be taken.

_____ _____
Printed Name of Parent or Guardian

_____
Phone Number

Date

_____ _____

Signature of Parent or Guardian

Email address (please print clearly)

The following information will be used by the classroom teacher. Please check any of the statements that apply to your child:

_____My child wears contact lenses.

_____My child is color blind.

_____ My child is allergic to _____ and cannot participate in lab activities which require the use of this substance.

Additional Resources

Flinn – Safety contract in English & Spanish
Flinn – Safety in Science Laboratories – Guidelines
Flinn – Safety Test in English & Spanish
https://www.flinnsci.com/resources/safety-reference/safety-contracts--exams/