

**LEE COUNTY SCHOOLS
CHEMICAL HYGIENE PLAN**

For School Science Labs



LCS Board Approved March 12, 2013

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LEE COUNTY SCHOOLS CHEMICAL HYGIENE PLAN For Science Labs

The Superintendent, as Chief Executive Officer, has the ultimate responsibility for the Chemical Hygiene Plan (CHP) within the school system and must, with other administrators, see that it is implemented and provided continued support.

INTRODUCTION

A. Purpose

This Chemical Hygiene Plan (CHP) establishes policies, standard operating procedures, safety equipment, and personal protective equipment designed to protect employees from health hazards presented by hazardous chemicals used in the science laboratories of this school system. It is intended to meet the requirements of 29 CFR 1910.1450 (Occupational Exposure to Hazardous Chemicals in Laboratories). See [Appendix A](#) for more information on Chemical Hygiene Plans.

B. Scope

The CHP is designed to protect employees from health hazards associated with the use of hazardous chemicals in the laboratory. This will be accomplished by:

1. Identifying hazardous chemicals in school science facilities and minimizing employees' exposure to those chemicals;
2. Outlining responsibilities of the district, department supervisors, chemical hygiene officers, principals, and other employees;
3. Identifying safe procedures;
4. Determining the adequacy of lab facilities and identifying equipment needed;
5. Developing procedures for procurement, distribution, and storage of chemicals;
6. Expanding an employee medical program to address chemical exposure problems;
7. Implementing a plan for monitoring safety equipment and storage areas;
8. Developing a process for recording and retaining chemical hazard records;

9. Posting chemical hazard signs and labels
10. Developing a written emergency plan to address accidents involving chemicals;
11. Establishing a chemical hazard training program; and
12. Developing a chemical waste disposal program.

C. Location

The plan will be available to all employees for review and a copy will be located in the following areas:

- Central Office
- Maintenance Department
- School Offices
- High School Science Departments

A copy of the district plan will also be posted on the Lee County Schools webpage.

D. Review and Update

The plan will be reviewed annually by the school district Chemical Hygiene Officer and/or designated committee and updated as necessary.

Chemical Hygiene Plan For Lee County School Science Labs

1. Hazardous Chemicals

The district Chemical Hygiene Officer, school Principals, and school chemical hygiene officers identify chemicals in inventory that are hazardous. A “hazardous chemical” is a chemical classified as a physical hazard or health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified by Title 29 CFR 1910.1200 (Revised 2012).

Hazardous chemicals are also rated by the NFPA (National Fire Protection Association) as 2 or higher in any category (NFPA Classifications are listed in **Appendix B**). A site-specific hazardous chemical inventory is located at each school.

2. Responsibilities

The Lee County School System appointed the Associate Superintendent for Auxiliary Services to provide necessary capital outlay for safety equipment. Schools will provide funds for current expense consumable items.

The School System Chemical Hygiene Officer (CHO) shall insure that building principals, school Chemical Hygiene Officers, and department personnel follow the CHP, work with the school officers to develop and implement the plan, conduct lab inspections, stay current in CHP legislation, check labeling, inventory chemicals, maintain records, provide technical assistance to school employees, determine need for protective equipment, insure that Safety Data Sheets (SDS) are in place, and review the plan annually. OSHA defines a Chemical Hygiene Officer as an employee who is designated by the employer, and who is qualified by training or experience, to provide technical guidance in the development and implementation of the Chemical Hygiene Plan. This definition is not intended to place limitations on the position description or job classification that the designated individual shall hold within the employer's organizational structure.

School System Principals are responsible for chemical hygiene in the school by monitoring school employee compliance with the plan and working closely with the district and school Chemical Hygiene Officers.

School Chemical Hygiene Officers are designated by principals as the building contact person for the CHP. They will ensure that training has been received by employees, provide housekeeping inspections, coordinate requests from and to the district CHP officer, coordinate acquisition, inventory, and use, if any, of hazardous chemicals within the building.

School Chemical Hygiene Officers will implement the CHP as they monitor the use of chemicals, maintain records of chemicals and their use, provide specific training, develop emergency plans for chemical spills and accidents, and review the plan annually.

Employees shall know and follow the CHP, know hazards associated with chemicals used, use safety equipment as designed, inform the Chemical Hygiene Officer of chemical problems, maintain storage areas in proper order, and help refine the CHP.

3. Safe Standard Operating Procedures

Standard operating procedures are established to protect employees from hazards associated with handling chemicals in the science laboratory. All employees shall follow general safety precautions when handling chemicals. The School District identifies specific procedures to help ensure a safe laboratory.

(See **Appendix F** for standard practices and rules).

- a. General Safety Practices are established to ensure a safe environment.
- b. General Lab Safety Rules are established to prevent injury regarding:
 - Conduct in lab
 - Personal hygiene
 - Protective clothing
 - Housekeeping
- c. Practices are established to ensure proper operation of fume hoods.
- d. Spill and Accident Procedures are established to minimize exposure to chemicals during emergency situations.
- e. Emergency Procedures
- f. Prior Approval Procedures

4. Lab Facilities and Equipment Guidelines

29 CFR 1910.1450 Subpart Z defines a laboratory as "a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis." If the middle schools do not use chemicals defined as hazardous according to section 1 of this document, they may not need the following equipment. However, prudence must be used in determining what safety equipment is necessary for middle school students working with non-hazardous materials.

- a. Lab facility is designed to ensure that employees have a safe working environment. (See **Appendix G** for more detail on lab facility design).
 - Adequate ventilation exists in the lab and storage area
 - Safety equipment is available for working with hazardous chemicals
 - Personal Protective equipment is available for everyone in the lab
 - Electrical outlets are strategically located and protected by GFIs

- b. Safety Equipment is properly maintained and checked regularly according to Section 7 of this document.

5. Chemical Procurement, Distribution, Storage and Handling Guidelines

Precautions for the handling and use of hazardous chemicals include: (See **Appendix H** for proper handling guidelines).

- a. Prior to ordering, a hazard assessment of the chemical should be conducted and only small quantities ordered at a time.
- b. Safe procedures should be followed for the receiving of chemical shipments.
- c. Chemicals should be inventoried at a minimum of once a year and assessed for container integrity and hazards.
- d. Proper storage by chemical families and safe handling procedures are in place for all hazardous chemicals including compressed gases, flammables, corrosive, and extremely hazardous chemicals.
- e. Prior approval procedures are in place for potentially dangerous chemicals or experiments.

6. Employee Medical Program

Each school should make first aid training available for personnel who work with chemicals.

Routine surveillance for those overexposed to chemicals should be arranged with a physician at no cost to the employee according to the Lee County Schools Contingency Plan.

- a. Employees shall be provided an opportunity for a medical evaluation:
 - When an employee develops signs or symptoms associated with a hazardous chemical to which he/she may have been exposed to in the lab.
 - Where exposure monitoring reveals an exposure level routinely above the action level or PEL for an OSHA regulated substance with exposure monitoring and medical surveillance requirements.
 - When an event, such as a spill, leak, or explosion, takes place in the work area resulting in exposure to a hazardous chemical.
- b. The employer shall provide the following information to the physician:
 - The identity of the hazardous chemical(s) to which the employee has been exposed.
 - The conditions under which the exposure may have occurred with any data collected during the incident.

- The signs and symptoms of exposure that the employee is experiencing.
 - A copy of the SDS for the chemical(s) involved.
- c. The employer shall obtain a written opinion from the physician, which shall include the following:
- A recommendation for further medical follow-up.
 - Results of the medical examination and associated tests.
 - Any medical condition revealed during the examination that may place the employee at increased risk due to exposure to a hazardous chemical.
 - A statement that the employee has been informed by the physician of the results and any medical condition requiring further exams.

7. Equipment Monitoring

Safety Equipment is properly maintained and monitored regularly to ensure that it is in proper working order:

- a. The following should be checked at least quarterly by the school CHO.
- A safety shower should provide adequate water flow.
 - Fire blanket should be checked for accessibility and wear.
 - Goggles, demonstration shields, and face shields should be checked for deterioration and scratches.
 - Storage areas
- b. The following should be checked monthly by the school CHO or qualified school or contracted personnel.
- Fire extinguisher
 - Emergency lighting
 - Any eyewash should provide adequate water flow.
- c. The following should be checked each semester by the county maintenance department. The School CHO or Principal should send a request to the county maintenance department each semester.
- Lab and chemical storeroom ventilation
 - Electrical circuits will be tested using approved circuit testers
 - Laboratory fume hood(s) and ducts

Permanent maintenance records will be retained including the date of inspection and the signature of the inspector. Records that are made by the school CHO will be stored in the science department office at the school or the school office. See [Appendix I](#) for sample maintenance logs. Those records made by the county maintenance department will be stored at the maintenance department.

Deficient or inoperative equipment will be repaired by qualified personnel, replaced, or removed immediately. If a repair or replacement cannot be made immediately, a work order should be

completed at once and sent to the proper school personnel. (See [Appendix J](#) for work order information).

8. Record Maintenance

Records are established and maintained for:

a. Any accidents and incidents involving chemicals

Copies of the accident form should be distributed in the following manner:

- o Teacher records
- o Administration
- o School Nurse

b. Ongoing employee chemical and safety training

Copies should be distributed in the following manner:

- a. District Chemical Hygiene Officer
- b. Associate Superintendent for Auxiliary Services
- c. School Principal

c. Comprehensive inventory and use of hazardous chemicals that are classified as hazardous if they display a 2 or higher in any category of the NFPA diamond. NTP, EPA, DOT, and NFPA classifications are listed in Appendices A, B, C, and D respectively. Chemicals shall be listed in alphabetical order along with the following information: school name, address, phone, person compiling inventory, date of inventory, amount, compatible family, storage location, NFPA hazard class, and date of purchase, if possible. Copies should be distributed in the following manner:

- o School Science Department records
- o School Principal
- o Associate Superintendent for Auxiliary Services

d. Safety Data Sheets

Upon completion of the hazardous chemical inventory, the manufacturers shall be notified if the SDS is missing and a new one requested. The SDS files will be stored alphabetically and copies of the SDS will be available in the workplace for easy access. An example of an SDS is located in [Appendix C](#). Copies should be distributed in the following manner:

- o Lab/classroom where chemicals are used
- o School office
- o District Chemical Hygiene Officer

e. Regular inspections of equipment and storage areas

Copies should be distributed in the following manner:

- o School Science Department records

f. All chemical disposal operations conducted

Copies should be distributed in the following manner:

- School Science Department records

9. Signs and Labels

Signs and labels are posted and maintained for:

- a. Emergency telephone numbers
- b. Safety equipment (showers, eyewash stations, fire blankets/extinguishers, exits, etc.)
- c. Containers of hazardous materials and rooms where hazardous materials are stored using the NFPA system.
- d. Special use areas (radiation, lasers, biohazards, Corrosives, Flammables, etc.)
- e. Trash must be labeled if it poses a hazard (biohazard, broken glass, etc.)

10. Emergency Plans for Spills and/or Accidents

a. A written Crisis Management Plan has been established for Lee County Schools and a written Contingency Plan also exists for the school system in accordance with the North Carolina School Operations Safety Manual. This information has been communicated to school personnel concerning:

- Failure of the ventilation system
- Proper evacuation procedures
- Proper, timely medical care
- Reporting systems
- Proper procedures for conducting emergency response drills

b. A spill control policy has been established (consult the Lee County Schools Crisis Management Plan for details.)

For prevention or containment of chemical spills
Appropriate cleanup of spills
Reporting system for chemical spills

c. Analysis of all accidents and near accidents.

11. Training Programs

A chemical training program has been developed and implemented:

- a. To provide employees, covered by the laboratory standard, information and training to assist them in assessing chemical hazards in their work area.

- b. To include employee understanding of physical hazards, health hazards, chemical route of bodily entry, hazardous chemical dosage, container labels, SDSs, safety equipment, accident procedures, and applicable references.

One system-wide training session will be held at the beginning of the school year for 6-12th grade science instructors. School principals or school CHOs will be responsible for additional training as new employees are hired after the initial training session or updates that occur as new assignments or chemicals are encountered.

See **Appendix K** for an outline of the training program.

12. Chemical Waste Disposal

Employees are apprised of the following procedures to properly dispose of chemical waste:

- a. Consult the Flinn Chemical Reference Catalog for proper collection and containment procedures of waste chemicals, for proper disposal techniques, or for proper preparation of the chemical for disposal.
- b. Contact the Associate Superintendent for Curriculum and Instruction at the Central Office who will send qualified personnel to pick up the material and safely transport it to a chemical disposal company.

Appendices

- A. OSHA Laboratory Standard: Chemical Hygiene Plan
- B. NFPA Classifications
- C. Globally Harmonized System Format for Safety Data Sheet
- D. Substances with Greater Hazardous Nature than Educational Utility
- E. Substances with a Hazardous Nature, but May Have Potential Educational Utility
- F. Standard Operating Procedures for Science Labs
- G. Lab Facility Design
- H. Chemical Procurement, Distribution, Storage, and Handling Guidelines
- I. Maintenance Log
- J. Maintenance: Submitting a Work Order
- K. Chemical Hygiene Plan Training Program
- L. Emergency Action Response Plan
- M. Regulations for Animals in the Classroom
- N. Biosafety Levels in Microbiology Labs
- O. List of District and School Chemical Hygiene Officers
- P. District Chemical Hygiene Plan Review Committee
- Q. Glossary

References

Center for Disease Control and Prevention. “BMBL Section II: Principles of Biosafety.” CDC: Office of Health and Safety. Updated: 6-17-99. CDC. May 23, 2005.
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Council of State Science Supervisors. Science Education Safety. CSSS. May 23, 2005.
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Occupational Safety and Health Administration, Unites States Department of Labor. North Carolina Occupational Safety and Health Standards for the General Industry (29 CFR PART 1910). Chicago, IL: Commerce Clearing House, Inc., 1995.

Roy, Ken. “Safe Science: Be Protected.” NSELA: Safe Science Series. National Science Education Leadership Association. May 23, 2005. <http://www.nsela.org/safesci8.htm>

The RTK Labeling Resource. “R-T-K How To.” The RTK Labeling Resource – labeling hazardous materials. The RTK Resource. May 23, 2005.
http://www.rtklabels.com/rtk_how_to/interpreting_NFPA.htm

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Appendix A

OSHA LABORATORY STANDARD, CHEMICAL HYGIENE PLAN

Many academic, industrial, and other laboratories that use hazardous chemicals are now required by federal regulations, known as the "OSHA Laboratory Standard" (29 CFR 1910.1450), to develop and implement chemical hygiene plans. This OSHA regulation is a "performance standard" meaning that there are few specific requirements to carry out certain procedures in a certain way. Results must be achieved; however, the manner by which the results are accomplished is not specified. The primary purpose of the plan is to protect workers, and support personnel such as office, custodial, maintenance, and repair personnel performing their normal duties, from overexposure to hazardous chemicals. While the Laboratory Standard does not apply to all laboratories, where it does, it supersedes the requirements of all other OSHA health standards in 29 CFR 1910, subpart Z.

It should be noted that although both employers and employees have responsibilities under the standard, only employers can be penalized for failure to comply with it. If an employee fails to comply with rules, the employer may be cited for a violation. In laboratory settings there is an obligation to maintain a safe work place for employees. The duty cannot be delegated by the employer to someone else. In other words it is not the duty of the Chemical Hygiene Officer (CHO) to ensure a safe work place. Any breach of duty can only be brought against the employer, not another employee. The result may be different when the questionable activity was a breach of a personal duty to care for the injured person.

In most states, WORKER'S COMPENSATION statutes can replace the common law negligence statutes. In these states, workers compensation operates to eliminate the need for proven negligence, fault, and duty of care. The most important aspect of workers compensation is the "EXCLUSIVITY OF REMEDY" component within which workers are barred from using any other legal route to sue an employer, but workers compensation protection is provided automatically. The only exceptions would be where the conduct or injury was outside the scope of employment or could be characterized as willful, malicious, or grossly negligent. Supervisory personnel would have immunity under the workers compensation law if their negligence was in performance of their duties.

Chemical Hygiene Officers would want to be certain that they are employees of the school when performing their duties, and that those for whom they are setting safety parameters are employees. If an injured party were a student, worker's compensation would not generally apply, common negligence statutes would.

A Chemical Hygiene Plan is a written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment, and work practices that are capable of protecting employees from health hazards presented by hazardous chemicals used in that particular workplace. The plan is reviewed and assessed for effectiveness annually.

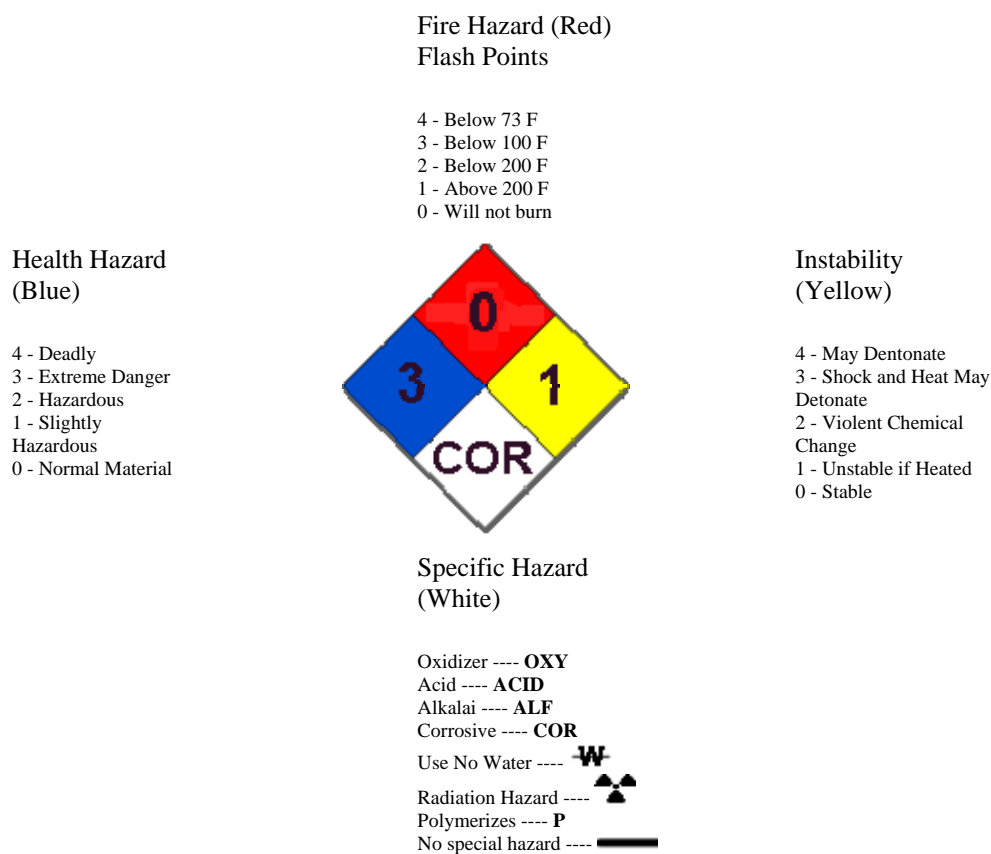
Source: Total Science Safety System by Jakel, Inc.

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Appendix B NFPA Classifications

The NFPA (National Fire Protection Association) diamond identifies health and physical hazards associated with specific chemicals. Originally, it was designed to inform firefighters of dangers present in emergency situations.

The NFPA diamond consists of the 4 color-coded areas below and rates the severity of each hazard on a scale from 0 (non-hazardous)– 4 (severe).



Source: <http://www.rtklabels.com//rtk-how-to/nfpa-right-to-know-labels.php>

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Appendix C Globally Harmonized System Format for Safety Data Sheet

SAFETY DATA SHEET

1. Product and Company Identification

Product name : Acetic Acid Glacial
Synonyms : Acetic Acid;Glacial
Recommended use and restrictions on use : make reagent above: Vam monomer,acetic anhydride,Hcl,insecticide....
Supplier detail : Chang Chun Petrochemical Co., Ltd 301 Songkiang Road, 7th Fl., Taipei, Taiwan, 10477
Emergency phone number : Tel: 886-2-25038131, 886-2-25001800

2. Hazards Identification

Hazard classification : Acute toxicity : Skin Contact; Corrosive to metal; Flammable liquids; Hazardous to the aquatic environment; Skin sensitization
Warning information : GHS label :

Signal word : Danger
Hazard statement : Flammable liquid and vapour;Harmful if inhaled;Harmful if swallowed;Harmful in Contact with skin;Harmful to aquatic life;May be corrosive to metals
Precautionary statement : Put the good place ventilating of container. If keep in touch with eyes, consult medical treatment after washing with a large amount of water at once. The clothes are polluted, take off immediately. In case of unexpected feeling uncomfortable, consult medical treatment immediately
Other hazards :

3. Composition/Information on Ingredients

Substances:
Product name : Acetic Acid Glacial
Synonyms : Ethanoic acid 、 Ethylic acid 、 Methanecarboxylic acid
CAS Number : 64-19-7
Ingredients : 100

4. First-Aid Measures

First-aid measures for different exposure routes :
Inhalation : If feel not comfortable, remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Skin Contact : Immediately flush skin with water or small amount of ethanol for at least 15 minutes and get medical aid immediately.
Eye Contact : Immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid if irritation develops or persists .
Ingestion : Do NOT induce vomiting. Give victim a glass of water. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.
Most important symptoms and hazardous effects : Serious harmful to eyes and skin.
Protection of First-aiders : Wear C- Class personal protective equipment
Notes to Physician : If swallow DO NOT gastrolavage

5. Fire-Fighting Measures

Extinguishing Media: Water spray, dry chemical, carbon dioxide (CO2), alcohol foam
Fire and Explosion Hazards: Wear self-contained breathing apparatus and protective clothing. Use water spray to keep fire-exposed containers cool.
Special Firefighting Procedures: No information
Special Equipment for the Protection of Firefighters: No information

6. Accidental Release Measures

Personal Precautions Eliminate all ignition sources. Absorb spill with vermiculite or other
--

inert material, then place in a container for chemical waste.
<p>Environmental Precautions: No information</p>
<p>Methods for Cleaning Up: For large spills: Flush spill area with water spray. Prevent runoff from entering drains, sewers, or streams.</p>

7. Safe Handling and Storage Measures

<p>Handling : Personal Precautionary Measures: Do not breathe vapor at concentrations greater than the exposure limits. Do not get in eyes, on skin, on clothing. Use only with adequate ventilation. Wash thoroughly after handling. Prevention of Fire and Explosion: Keep away from heat and flame. Keep from contact with oxidizing materials. Use with adequate ventilation.</p>
<p>Storage : Keep away from toxic substances. Keep container closed. Keep away from incompatible substances.</p>

8. Exposure Controls/Personal Protection

<p>Engineering Measure : IF VENTILATION DOES NOT MAINTAIN INHALATION EXPOSURES BELOW PEL (TLV), USE NIOSH/MSHA APPROVED RESPIRATOR AS PER CURRENT 29 CFR 1910.134, INSTRUCTIONS/WARNINGS AND NIOSH-RESPIRATOR SELECTION. Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING OR DRINKING. LAUNDRER CONTAMINATED CLOTHING BEFORE REUSE. Suppl. Safety & Health Data: CORROSIVE MATERIAL - AVOID CONTACT.</p>			
Control Parameters			
8 hours time weighted average exposure limits TWA	Short-term exposure limits STEL	Maximum exposure limits CEILING	biological standards
10	15		
Personal protective equipment : Eyeglasses, gloves, helmet, mask, safety shower, eye wash fountain.			
Respiratory protection :			
Hand protection : Chemical resistant gloves. (Butyl rubber , Polyvinyl alcohol)			
Eye protection :			
Skin and body protection : Wear appropriate protective gloves and clothing to prevent and minimize contact with skin.			
Specific hygiene measures : Wash hand before eating and drinking.			

9. Physical and Chemical Properties

Appearance(physical state, color, etc.) : Clear Liquid @ above 16°C	Odor : Pungent, vinegar
Odor threshold : 0.037-0.15ppm(detected)	Melting point : 16°C
pH : 2.4(1M/1L water)	Boiling point/boiling Range : 117.9 °C
Flammability : -	Flash point & method : 39 °C
Decompositon temperature : -	used : closed cup
Autoignition temperature : 516°C(crystal)	Explosion limits : No information available
Vapor pressure : 15.7 mmHg@25°C	Vapor density : 2.07(Air=1)
Density : 1.05(water=1)	Solubility : easy dissolve in water
Partition coefficient n-octanol/water : -0.17	Evaporation rate : 0.97(ether=1)

10. Stability and Reactivity

Stability: Stable under normal conditions.
Possible Hazardous Reactions Occurring under Specific Conditions : Hazardous Polymerization: Will not occur
Conditions to Avoid :
Materials to Avoid : Incompatibility: Material can react with metals, bases, strong oxidizing agents, amines.
Hazardous Decomposition Products : Carbon dioxide, carbon monoxide

11. Toxicological Information

Routes of exposure(inhalation, ingestion, skin and eye contact) :
Symptoms : acidity, burn, pulmonary edema, dermatitis, anisocoria Acute toxicity : General: Acute overexposure to extremely high airborne concentrations of respiratory irritants has been associated with development of an asthma-like reactive airways syndrome (RADS) in susceptible individuals. Extremely high airborne concentrations are not generated during normal conditions of use but may occur following a spill. The potential to generate extremely high airborne concentrations in a spill situation depends upon physical factors such as the concentration of the solution, the volume of the spill, the surface area of the spill, the size of the room where the spill occurred, and the ventilation rate in the room. Inhalation: Vapor extremely irritating. Eyes: Causes severe burns. Vapor extremely irritating. Skin: Causes severe burns. Ingestion: May be fatal or harmful if swallowed. May cause burns of the gastrointestinal tract if swallowed.
Chronic Toxicity or delayed Toxicity : Acute Toxicity Data: Oral LD-50 (rat): 3310-3530 mg/kg Oral LD-50 (mouse): 4960 mg/kg. Inhalation LC-50 (mouse): 5620

ppm/1 hour(s) Dermal LD-50: 1060 mg/kg. Skin irritation: severe.
 Eye irritation: severe

12. Ecological Information

Ecotoxicity : LC50 (fish) : 75-88 mg/96H

EC50 (Aquatic

Invertebrates) : 32mg/l/48H BCF : < 1

Persistence and degradability : No information

Bioaccumulative potential : No bioaccumulative

Mobility in soil : Permeate to soil ,easy vaporize to air

other adverse effect : -

13. Disposal Considerations

Recommended Methods for Safe and Environmentally Preferred Disposal :

Discharge, treatment, or disposal is subject to national, state, or local laws. Contract with a licensed chemical disposal agency. Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport Information

UN number : 2789

UN proper shipping name :

ACETIC ACID GLACIAL or ACETIC ACID SOLUTION more than 80% acid by mass

Transport hazard class : corrosive and flammable material

Packing group : II

Marine pollution : NO

Specific precautionary transport measures and conditions : -

15. Regulatory Information

Applicable Regulations :

Carcinogenicity Classification (components present at 0.1% or more):

- International Agency for Research on Cancer (IARC): None
- American Conference of Governmental Industrial Hygienists (ACGIH): None
- National Toxicology Program (NTP): None
- Occupational Safety and Health Administration (OSHA): None

16. Other Information

Literature references :

- 1.CHEMINFO Data base , CCINFO CD-R , 2005-1
- 2.RTECS Data base , TOMES PLUS CD-R , Vol.63 , 2005
- 3.ChemWatch Data base , 2004-4

Organization:

Name : Chung Chun Petrochemical Co., Ltd

Address/Telephone :

246 FU SING FU AN LI MIAOLI. TAIWAN R.O.C./ +886-37-320673

Person who prepared the GHS

Title : Engineer

Name : Sano Chang

Date the GHS was prepared : 2008/8/11 02:58:19 PM Revised Version : 2012/1/11 02:58:00

PM

Appendix D Substances with Greater Hazardous Nature than Educational Utility

Chemicals used in the laboratory may be hazardous because of the following:

- ◆ Safety risks (i.e., highly flammable or explosive material)
- ◆ Acute and chronic health hazards
- ◆ Environmental harm
- ◆ Impairment of indoor air quality

Assessment of the chemicals in this list indicates that their hazardous nature is greater than their potential usefulness in many school programs. Evaluation includes physical hazards (i.e., flammability, explosive propensity, reactivity, corrosivity) and health hazards (i.e., toxicity, carcinogenicity).

This following list of chemicals was generated from the *Manual of Safety and Health Hazards in the School Science Laboratory* published by U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health [1984].

Carcinogenic substances were identified from the *Report on Carcinogens* (10th Edition) generated by the National Toxicology Program (2002).

Chemical	CAS Number	Hazard
Acrylonitrile	107-13-1	Flammable (NFPA = 3), reasonably anticipated human carcinogen
Ammonium chromate	7788-98-9	Oxidizer, known human carcinogen
Aniline	62-53-3	Combustible, may be fatal if inhaled, ingested or absorbed through the skin
Aniline hydrochloride	142-04-1	May be fatal if inhaled, ingested, or absorbed through the skin
Anthracene	102-12-7	Irritant, may cause an allergic skin reaction
Antimony trichloride	10025-91-9	Corrosive
Arsenic and its compounds	N/A	Known human carcinogen
Asbestos	1332-21-4	Known human carcinogen
Ascarite II	N/A	Corrosive, may be fatal if ingested
Benzene	71-43-2	Flammable (NFPA = 3), known human carcinogen, mutagen

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Chemical	CAS Number	Hazard
Benzoyl peroxide	94-36-0	Flammable (NFPA = 3), explosive, oxidizer
Calcium cyanide	592-01-8	May be fatal if inhaled or ingested
Carbon disulfide	75-15-0	Flammable (NFPA = 4), acute cns toxicity and peripheral neurotoxicity
Carbon tetrachloride	56-23-5	May be fatal if inhaled or ingested, reasonably anticipated human carcinogen
Chloral hydrate	302-17-0	Controlled barbiturate
Chlorine	7782-50-5	Oxidizer, corrosive, may be fatal if inhaled
Chloroform	67-66-3	Reasonably anticipated human carcinogen
Chlorpromazine	50-53-3	Controlled substance
Chromium hexavalent compounds	N/A	Known human carcinogen
Chromium trioxide	1333-82-0	Oxidizer, Corrosive, known human carcinogen
Colchicine	64-86-8	May be fatal if ingested, mutagen
p-Dichlorobenzene	106-46-7	Combustible, reasonably anticipated human carcinogen
Dimethylaniline	121-69-7	May be fatal if inhaled, ingested, or absorbed through the skin
p-Dioxane	123-91-1	Flammable (NFPA = 3), forms peroxides (Group 2), reasonably anticipated human carcinogen
Ethylene dichloride (1,2-Dichloroethane)	107-06-2	Flammable (NFPA = 3), reasonably anticipated human carcinogen, mutagen
Ethylene oxide	75-21-8	Flammable (NFPA = 4), explosive (NFPA = 3), may be fatal if inhaled or absorbed through the skin, known human carcinogen
Gunpowder	N/A	Explosive
Hexachlorophene	70-30-4	May be fatal if inhaled, ingested, or absorbed through the skin, possible teratogen
Hydrobromic acid	10035-10-6	Corrosive, may be fatal if inhaled or ingested
Hydrofluoric acid	7664-39-3	Corrosive, may be fatal if inhaled or ingested (liquid and vapor can cause severe burns not always immediately painful or visible but possibly fatal)
Hydrogen	1333-74-0	Flammable (NFPA = 4)

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Chemical	CAS Number	Hazard
Hydriodic acid	10034-85-2	Corrosive, may be fatal if inhaled or ingested
Lead arsenate	7784-40-9	Known human carcinogen, teratogen
Lead carbonate	1319-46-6	May be fatal if inhaled or ingested, neurotoxic
Lead (VI) chromate	7758-97-6	May be fatal if inhaled or ingested, known human carcinogen
Lithium, metal	7439-93-2	Combustible, water reactive
Lithium nitrate	7790-69-4	Oxidizer
Magnesium, metal (powder)	7439-95-4	May ignite spontaneously on contact with water or damp materials
Mercury	7439-97-6	Corrosive, may be fatal if inhaled or ingested
Mercuric chloride	7487-94-7	May be fatal if inhaled, teratogen
Methyl iodide (iodomethane)	74-88-4	May be fatal if inhaled, ingested or absorbed through the skin, potential carcinogen (NIOSH)
Methyl methacrylate	80-62-6	Flammable (NFPA = 3), explosive (vapor)
Methyl orange	547-58-0	Possible mutagen
Methyl red	493-52-7	Possible mutagen
Nickel, metal	7440-02-0	Reasonably anticipated human carcinogen, mutagen
Nickel oxide	1314-06-3	Reasonably anticipated human carcinogen, mutagen
Nicotine	45-11-5	May be fatal if inhaled, ingested, or absorbed through the skin
Osmium tetroxide	20816-12-0	May be fatal if inhaled or ingested
Paris green	12002-03-8	May be fatal if inhaled, ingested or absorbed through the skin, known human carcinogen
Phenol	108-95-2	Combustible (liquid and vapor), corrosive, may be fatal if ingested or absorbed through the skin
Phosphorus pentoxide	1314-56-3	Water reactive, corrosive

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Chemical	CAS Number	Hazard
Phosphorous, red, white	7723-14-0	May ignite spontaneously in air
Phthalic anhydride	85-44-9	Combustible/finely dispersed particles form explosive mixtures in air,
Potassium, metal	7440-09-7	Flammable (nfpa = 3), water reactive, forms peroxides
Potassium oxalate	583-52-8	Corrosive, may be fatal if ingested
Potassium sulfide	1312-73-8	Spontaneously combustible, explosive in dust or powder form, corrosive
Pyridine	110-86-1	Flammable (nfpa = 3), possible mutagen
Selenium	7782-49-2	Severe irritant
Silver cyanide	506-64-9	May be fatal if inhaled, ingested or absorbed through the skin
Silver nitrate	7761-88-8	Oxidizer, corrosive, may be fatal if ingested
Silver oxide	20667-12-3	Oxidizer
Sodium arsenate	7778-43-0	May be fatal if inhaled or ingested, known human carcinogen
Sodium arsenite	7784-46-5	Known human carcinogen, teratogen
Sodium azide	26628-22-8	Explosive, may be fatal if ingested or absorbed through the skin
Sodium chromate	7775-11-3	Oxidizer, corrosive, known human carcinogen
Sodium cyanide	143-33-9	May be fatal if inhaled, ingested or absorbed through the skin
Sodium dichromate	10588-01-9	Oxidizer, corrosive, may be fatal if ingested, known human carcinogen
Sodium nitrite	7632-00-0	Oxidizer
Sodium sulfide	1313-82-2	Corrosive, may be fatal if inhaled or ingested
Sodium thiocyanide	540-72-7	Contact with acid liberates very toxic gas
Stannic chloride (anhydrous)	7646-78-8	Corrosive, hydrochloric acid liberated upon contact with moisture and heat

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Chemical	CAS Number	Hazard
Stearic acid	57-11-4	May form combustible dust concentration in the air
Strontium	7440-24-6	Water reactive
Strontium nitrate	10042-76-9	Oxidizer
Sudan IV	85-83-6	Irritant, toxic properties have not been thoroughly evaluated
Sulfuric acid, fuming	8014-95-7	Corrosive, may be fatal if ingested
Tannic acid	1401-55-4	Irritant
Tetrabromoethane	79-27-6	May be fatal if inhaled, ingested or absorbed through the skin
Thioacetamide	62-55-5	Reasonably anticipated human carcinogen
Thiourea	62-56-6	Reasonably anticipated human carcinogen
Titanium trichloride	7705-07-9	Water reactive, corrosive
Titanium tetrachloride	7550-45-0	Water reactive, corrosive, may be fatal if inhaled
o-Toluidine	95-53-4	Reasonably anticipated human carcinogen, mutagen
Uranium	7440-61-1	Radioactive material
Uranyl acetate	541-09-3	Radioactive material
Urethane	51-79-6	Combustible, reasonably anticipated human carcinogen
Wood's metal	8049-22-7	May be fatal if inhaled or ingested, known human carcinogen (cadmium), neurotoxic

Source: NIOSH School Chemistry Laboratory Safety Guide, Appendix C, October 2006.

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Appendix E Substances with a Hazardous Nature, but May Have Potential Educational Utility

These chemicals should be removed from the schools if alternatives can be used. For those that must be retained, amounts should be kept to a minimum. These are appropriate for advanced-level High School classes only.

This following list was generated from the *Manual of Safety and Health Hazards in the School Science Laboratory* published by U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health [1984].

Carcinogenic substances were identified from the *Report on Carcinogens* (10th Edition) generated by the National Toxicology Program (2002).

Chemical	CAS Number	Hazard
Acetamide	60-35-5	Combustible solid
Aluminum chloride	7446-70-0	Water reactive, corrosive
Ammonium bichromate	7789-09-5	Oxidizer, corrosive, known human carcinogen
Ammonium oxalate	1113-38-8	May be fatal if inhaled or ingested
Ammonium vanadate	7803-55-6	May be fatal if inhaled or ingested
Antimony	7440-36-0	May be fatal if inhaled, irritant
Antimony oxide	1309-64-4	Irritant
Antimony potassium tartrate	11071-15-1	Irritant
Barium chloride	10361-37-2	May be fatal if ingested, irritant

Chemical	CAS Number	Hazard
Benzene (phenylbutazone)	50-33-9	Irritant
Beryllium carbonate	66104-24-3	Irritant
Bromine	7726-95-6	Oxidizer, corrosive, may be fatal if inhaled or ingested
Cadmium and cadmium compounds	N/A	Known human carcinogen
Carmine	860-22-0	Irritant, burning may produce carbon monoxide, carbon dioxide, sulfur oxides, and nitrogen oxides.
Catechol	120-80-9	Corrosive
Chromic acid	7738-94-5	Oxidizer, known human carcinogen
Chromium acetate	1066-30-4	Irritant
Cobalt, metal	7440-48-4	Possible human carcinogen (IARC, Group 2B)
Cobalt nitrate	10141-05-6	Oxidizer, irritant
Cyclohexane	110-82-7	Flammable (NFPA = 3)
Cyclohexene	110-83-8	Flammable (nfpa = 3), corrosive, forms peroxides
Dichloroindophenol sodium salt	620-45-1	Irritant
2,4-Dinitrophenol	51-28-5	Irritant
Ferrous Sulfate	7720-78-7	Irritant
Formaldehyde (formalin)	50-00-0	Flammable (NFPA = 3), reasonably anticipated human carcinogen

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Chemical	CAS Number	Hazard
Fuchsin (acid/basic)	3244-88-0/ 632-99-5	Irritant
Gasoline	8006-61-9	Flammable (NFPA = 3)
Hematoxylin	517-28-2	Irritant
Hydrogen sulfide	7783-06-4	Corrosive
Hydroquinone	123-31-9	May be fatal if ingested
Isoamyl alcohol (isopentyl alcohol)	123-51-3	Irritant, combustible liquid and vapor
Isobutyl alcohol	78-83-1	Flammable (NFPA = 3)
Magnesium chlorate	10326-21-3	Irritant
Methyl ethyl ketone	78-93-3	Irritant, flammable (NFPA = 3)
Methyl oleate	112-62-9	Toxic properties not investigated
Nickel carbonate	3333-67-3	Reasonably anticipated human carcinogen
Nickelous acetate	373-02-4	Reasonably anticipated human carcinogen
Paradichlorobenzene	106-46-7	Irritant
Pentane	109-66-0	Irritant, flammable (NFPA = 4)
Petroleum ether	8032-32-4	Flammable (NFPA = 4)
1-Phenyl-2-Thiourea (Phenylthiocarbamide)	103-85-5	May be fatal if inhaled or ingested
Potassium chlorate	3811-04-9.	Oxidizer

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Chemical	CAS Number	Hazard
Potassium chromate	7789-00-6	Oxidizer, known human carcinogen
Potassium periodate	7790-21-8	Oxidizer
Potassium permanganate	7722-64-7	Oxidizer, corrosive
Salol (phenyl salicylate)	118-55-8	Irritant
Sodium bromate	7789-38-0	Oxidizer
Sodium chlorate	7775-09-9.	Oxidizer
Sodium fluoride	7681-49-4	May be fatal if inhaled or ingested
Sodium oxalate	62-76-0	Corrosive, may be fatal if ingested
Sodium nitrate	7631-99-4	Oxidizer, irritant
Sodium silicofluoride	16893-85-9	Toxic
Sudan III	85-86-9	Decomposes to oxides of nitrogen
Sulfamethazine	57-68-1	Irritant
Toluene	108-88-3	Flammable (NFPA = 3), irritant, may be fatal if ingested
Trichloroethylene	79-01-6	Reasonably anticipated human carcinogen
Urethane	51-79-6	Combustible, reasonably anticipated human carcinogen
Xylenes	1330-20-7	Flammable (NFPA = 3), irritant, may be fatal if ingested

Source: NIOSH School Chemistry Laboratory Safety Guide, Appendix C, October 2006.

Appendix F

Standard Operating Procedures (SOP) for Science Labs

A. General Safety Practices established to ensure a safe environment

1. Minimize exposure to hazardous chemicals.
2. Avoid underestimation of chemical hazards and risks.
3. Use personal protective equipment (PPE) to reduce potential exposure.
4. Never work alone in the laboratory or anywhere chemicals are present.
5. Always practice first-time demonstrations before performing with students to evaluate the safety of the demonstration.
6. Teachers should set a good example when conducting experiments or demonstrations by wearing proper safety gear.
7. Train all students in the location and use of safety equipment in the lab.
8. Teachers should supervise students constantly during lab, never leaving them alone in a lab.
9. Know how to properly handle and store all chemicals according to Section 5 of this document.
10. Know the locations of all emergency equipment: eyewash, safety shower, fire extinguisher, fire blanket, and spill control materials.
11. Know the location and how to use master utility controls to shut off gas, electrical, and water supplies.
12. Know the hazards of the chemical as stated in the SDS, chemical label and other references.
13. Know proper disposal procedures for chemicals.
14. Know appropriate emergency procedures for power failures, spills and accidents, first aid policies, waste disposal, spill clean-up, evacuation routes, and fire emergency notification.
15. Know general lab rules and procedures as outlined in the Chemical Hygiene Plan.
16. All work surfaces and lab equipment should be thoroughly cleaned after each use.

B. General Laboratory Rules and Procedures established to prevent injury

1. Conduct in Lab

- a) Before using any chemical, read the hazards and precautions for protection on the chemical label and SDS.
- b) Insure that lab safety contracts are understood and signed by students.
- c) Only teachers with appropriate safety training should supervise lab experiments.
- d) The lab should never be used for purposes other than the science instruction for which it was designed.
- e) Sufficient fire extinguishers of the appropriate type and size, as described in **Appendix G** of this document, should be located in the lab and only trained individuals should use them.
- f) An alternative evacuation route should be planned and posted in the event the primary route becomes blocked.
- g) Practice emergency plans.
- h) Do not run in the laboratory. Avoid behavior which may confuse, startle, or distract another person in the lab.
- i) Do not use chipped, cracked, or etched glassware. Damaged glassware poses a serious breakage hazard when heated or handled.
- j) Treat all glassware as if it were hot. Use a rubberized mitt to move hot objects.

- k) When inserting glass tubing into a hole in a rubber stopper, use the following procedure: moisten the outside portion of the glass tubing that will be inserted into the rubber stopper with glycerin, cover the glass tubing with a cloth or paper towel, grasp the tubing near the stopper, use a gentle rotating motion to twist the tubing through the stopper. While holding the stopper, be careful to keep your hand out of the path of the glass tubing. Pressure should always be applied away from you.
- l) When experiments have been completed, turn off gas, hot plates, and burners.
- m) When diluting acids, always pour the acid slowly into the water to minimize the risk of having acid splashed on you. Also, stir gently or use an ice bath to dissipate the heat generated.
- n) Never leave a lighted burner unattended.
- o) When heating chemicals in a test tube, gently move the test tube back and forth through the flame. Turn it away from yourself and others in the lab.
- p) To avoid contamination, do not return unused chemicals to a reagent bottle.
- q) Electrical equipment should not be operated with wet hands.
- r) Dispose of all chemicals in accordance with state and local regulations.
- s) Never mix unknown substances.
- t) Check for unsafe conditions and see that they are corrected immediately.
- u) Lock labs when they are not being used and hazardous chemicals or equipment are in the room.
- v) Glycerin should be available only to the teacher. If used in lab, teachers should monitor it carefully.

2. Personal Hygiene Guidelines

- a) Do not drink from glassware or other lab containers.
- b) Never bring food, drinks, or chewing gum into a lab area.
- c) Do not apply cosmetics in areas where lab chemicals are present.
- d) Avoid skin contact with chemicals.
- e) Wash hands thoroughly with soap after any chemical exposure and before leaving the lab.
- f) Never smell chemicals directly; always waft the odors to your nose using your hand.
- g) Avoid the use of contact lenses in the laboratory. If contact lenses must be worn, inform the science teacher. Special precautions must be taken.

3. Protective clothing requirements

- a) Everyone in the lab must wear eye protection, including visitors. Chemical splash goggles and impact glasses must meet the ANSI Z87.1 Standard. Do not wear contact lenses in the lab, if possible. If contacts must be worn in lab, unvented goggles should be worn over them at all times. Safety goggles must also fit over eyeglasses.
- b) Chemical splash goggles must be worn whenever a fire, splash, or glass hazard is present.
- c) Teachers should wear face shields when pouring larger quantities of full strength corrosive liquids (i.e. full strength acids and bases) to make solutions. Teachers who need to use full strength corrosive liquids with students shall gain prior approval from the Chemical Hygiene Officer. If the full-strength corrosive chemical is approved for use in the lab for educational purposes, the students shall be properly trained of its

hazards, corrosive nature, and first aid; in addition they shall practice appropriate emergency procedures before using the chemical. The CHO, shall train students, if necessary, to ensure that the teacher and students wear the appropriate Personal Protective Equipment (PPE) and follow all necessary safety precautions.

- d) Wear gloves that offer appropriate protection for hazards encountered in the lab (i.e. corrosive liquids, heat, etc...). Test for holes every time you wear your gloves.
- e) A full-length lab coat or a chemical-resistant apron should be worn when working with hazardous chemicals.
- f) Low-heeled, closed-toed shoes should be worn at all times in the lab with corrosives. Do not wear perforated shoes or sandals of any kind.
- g) Confine long hair and loose clothing, jewelry and neckties.
- h) Do not wear a watch with an absorbent strap.
- i) Use a safety shield during demonstrations in which an explosion or implosion might occur.
- j) Inspect all personal protective equipment before use. If defective, do not use.

4. Housekeeping Rules

- a) Keep chemicals in the chemical prep and storage area. If chemicals are moved to the classroom or lab, they must be returned to their proper storage location by the end of the day. If chemicals must be left in the lab overnight, they need to be properly labeled and the lab must be locked.
- b) Waste materials require proper containers and appropriate labels.
- c) Label all chemicals with names and hazards, including solutions. All labels should face the front of shelves.
- d) Do not block fire exits, emergency equipment, and master utility controls.
- e) Keep all aisles clear.
- f) Work and floor surfaces should be cleaned regularly and kept free of clutter.

C. Use of the Fume Hood

- 1. Use the hood for operations which release toxic chemical vapors or dust (i.e. preparation of acid or caustic solutions, working with metal powders, etc.).
- 2. Use the hood when working with volatile substances.
- 3. Use only those chemicals for which the quality of the available ventilation system is appropriate.
- 4. Monitor hood performance on a regular basis to ensure adequate airflow.
- 5. Keep hood sash at an appropriate level for adequate hood performance during operation.
- 6. Do not allow materials in hoods to block vents or airflow.
- 7. Do not store materials in hoods.

D. Spill and Accident Procedures

- 1. Send designated runner to get help or call for help if necessary.
- 2. Emergency telephone numbers should be posted near the phone.
- 3. Follow the written emergency response procedure as outlined in the CHP or Safe Schools Plan.
- 4. Assess the situation. Evacuate the area if necessary.

5. Clean up spills and breakages immediately and thoroughly using appropriate protective apparel and following approved spill clean-up procedures. Only appropriately trained teachers should clean up spills or broken glass, not students. Only staff trained in blood-borne pathogens should clean up spills of blood or body fluids.
6. A bucket of dry sand should be available as a Class D fire extinguisher and to aid in absorbing spills and providing traction on a slippery floor.
7. A spill kit containing the following items should be readily available: neutralizing chemicals for both acid and base spills (such as vinegar and baking soda), dry sand, kitty litter, or other spill control materials. A plastic broom and dustpan and garbage pan should also be available.
8. For clean-up of small spills, dike and absorb the spill with an absorbent material. Neutralize the spill if necessary and sweep up into a separate garbage bag. Label the bag and dispose of properly. Store in accessible area on the ground.
9. Fill out a detailed accident report after the emergency is over.

E. Emergency Procedures

1. Eye contact: Wash eyes immediately with large amounts of running water, lifting upper and lower eyelids, for 15 - 20 minutes. Seek medical attention.
2. Skin contact: Immediately remove contaminated clothing. Wash affected area with soap or mild detergent and large amounts of water for 15 - 20 minutes. Use safety shower if contamination is extensive. Seek medical attention.
3. Ingestion: If victim is conscious, give large amounts of water to dilute chemical. Refer to SDS before proceeding further. Seek medical attention.
4. Inhalation: Immediately remove victim from exposure area to fresh air. If breathing has stopped, use a mouth guard to perform artificial respiration. Keep patient warm and quiet. Seek medical attention.
5. Fire: For large fires, evacuate according to the Safe Schools Plan. Use safety equipment that is immediately available to extinguish small fires (water, eyewash, safety shower, sand, apron, fire blanket, fire extinguisher). NOTE: Do not wrap up in vertical mounted fire blankets. A tunneling effect could cause the flames to burn the face or hair. Pull the blanket from its case and throw it over the flames.
6. Burns: Flood with cold water to draw the heat away. Do not apply ointments.

F. Prior Approval Procedures

1. The ordering of any hazardous chemical must be approved by the school CHO. (See **Appendices D and E** for information on specific chemicals).
2. In order to keep pets in the classroom, Approval Form A-4170-A from the Lee County Administrative Manual should be completed and approval obtained from the school principal. All guidelines on the form should be followed. (See **Appendix M** for guidelines regarding animals).
3. The following procedures should not be performed in a school laboratory:
 - a) Experimentation with real blood.
 - b) Experimentation with live animals resulting in harm to the animal. (See **Appendix M** for appropriate work with animals)
 - c) Experimentation with poisonous plants.

G. Biosafety Procedures

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1. Care must be taken when dealing with the following biohazards:
 - a) Human, animal, and plant pathogens: bacteria, fungi, viruses, parasites, rickettsiae, Chlamydia, toxins
 - b) All human and animal blood, blood products, tissues, and body fluids
 - c) Cultured cells and potentially infectious agents
 - d) Allergens
 - e) Recombinant DNA products
 - f) Clinical, necropsy and surgical specimens (tissues, fluids, etc.)
2. The following minimum PPE must be worn when working with biohazards:
 - a) Gloves
 - b) Safety goggles
 - c) Lab apron or coat
3. The following safety equipment should be provided in the lab:
 - a) Eyewash/shower
 - b) Sink
 - c) Lab surfaces are water and chemical-resistant
 - d) Master utility shut-offs
 - e) Spill control kit
 - f) Adequate ventilation
4. For Microbiology and DNA labs: Only Biosafety Level 1 work, as defined by the Center for Disease Control-National Institutes of Health publication *Biosafety in Microbiological and Biomedical Laboratories*, 2nd ed., May, 1988 is conducted. (See **Appendix N**)
5. Standard Operating Procedures for Biosafety
 - a) Access to lab is limited or restricted when experiments or work with cultures and specimens are in progress.
 - b) Hands should be washed with soap after handling viable material and animals, after removing gloves, and prior to leaving the lab.
 - c) All procedures are performed carefully to minimize the creation of splashes or aerosols.
 - d) All general lab rules and procedures listed above apply.
 - e) Work surfaces are decontaminated at least once a day and after any spill of viable material
 - f) All cultures, stocks, and other regulated wastes are decontaminated before disposal by an approved decontamination method, such as autoclaving. Materials to be decontaminated outside of the lab are to be stored in a durable leak proof container and closed for transport from the lab. Materials to be decontaminated at an off-site location are packaged in accordance with applicable state, local, and federal regulations, before removal from the facility.
 - g) An insect and rodent control program is in effect.
 - h) An Exposure Control Plan for Bloodborne pathogens should be in place.

Adapted from the Total Science Safety System by Jakel, Inc. and NSELA: Safe Science Series by Ken Roy.

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Appendix G

Lab Facility Design

A. Ventilation

- 1) The lab should be well ventilated.
- 2) Storage area should be ventilated. The chemical storage exhaust should be isolated from the general building system, and the stack located away from any other air intake.
- 3) At least one functioning exhaust hood should be provided if chemicals are used extensively (face velocity approximately 60-100 lfm). Middle school chemical demand should not be complex enough to demand the use of a hood. The exhaust hood should be located away from primary entrance/exit and high traffic areas. It should vent outside the building and well above the roof level of other rooms.

B. Safety Equipment

- 1) A UL approved fire blanket should be located in the lab within 25 feet of the chemical storage area. Vertical mounted fire blankets are not recommended.
- 2) Appropriate, functioning fire extinguishers should be located, installed, and maintained according to *Standards for the Installation of Portable Fire Extinguishers*, NFPA 10, 1998. A Triclass ABC (minimum 15 pound gross weight) fire extinguisher is appropriate for labs. Carbon Dioxide fire extinguishers are not sufficient for lab use. A Class D fire extinguisher, such as a properly labeled bucket of sand, should be available when working with flammable solids.
- 3) Approved fire alarms or smoke detectors should be strategically located in or near the lab.
- 4) All labs should have an eyewash station capable of treating both eyes continuously for 15 minutes with large quantities of aerated water. Teach everyone how to use the eyewash quickly in case of an emergency. Eyewash stations should be located within 10 seconds travel time from any point in the lab. An approved eyewash station should also be within 10 seconds travel time from the chemical storage and prep areas.
- 5) Safety showers or body drenches should be located less than 50 ft from workstations where chemicals are used and less than 25 ft from an exit. (ANSI Standard 117.1)
- 6) For safety showers without drains, non-skid mats should be placed on the floor under the showerhead.
- 7) Sanitizing and/or sterilizing equipment should be available for cleaning eye protective equipment. Goggles should undergo a 15 minutes cycle in UV goggle cabinets.
- 8) A spill kit should be available for quick access.
- 9) Bucket(s) of sand, vermiculite, or other absorbent material should be available in the lab to control chemical spills.
- 10) Enclosed labeled containers should be provided for disposal of broken glassware.
- 11) A first aid kit should be readily available for teacher use.
- 12) A phone or functioning intercom system for emergencies should be in the lab or no further than a one minute walk from the lab or an emergency action response plan should be in place for each class in the event of an emergency.
- 13) Lab doors should open outward to facilitate rapid exit during an emergency or school policies should require lab doors (except in the case of fire doors) to be propped open wide while students or staff are inside.
- 14) Items exceeding recommended weight capacities should not be stored on top of cabinets.

- 15) Lab sinks should have hot and cold running water.
- 16) An adequate well-ventilated stockroom should be separate from the lab and locked when not in use.
- 17) To insure adequate supervision, the student: teacher ratio in lab should not exceed the NSTA recommended ratio of 24:1.
- 18) A sufficient number of adequate lab stations should be easily accessible by the maximum number of students in lab.
- 19) Work surfaces should be of nonporous chemical-resistant materials.
- 20) If using glassware, chemical resistant borosilicate glassware should be used for lab experimentation.
- 21) Lasers (3.0 milliwatts) should be kept either above or below the normal field of vision and properly grounded when in use.
- 22) SDSs should be easily accessible.
- 23) Records of regular maintenance should be produced and filed for future reference.

C. Personal Protective Equipment

- 1) ANSI approved chemical splash goggles and face shields should be available for eye protection when dealing with fire, glass, or splash hazards. Unvented goggles should be available for contact lens wearers. Goggles should also be available for visitors.
- 2) Heat resistant gloves, safety tongs, or rubberized mitts should be available for handling very hot or cryogenic substances.
- 3) Chemical resistant aprons or lab coats should be available to protect clothing.
- 4) A face shield should be available for teacher use.

D. Electrical

- 1) Sufficient electrical outlets should be available to eliminate the use of extension cords and are properly grounded and capped when not in use.
- 2) Ground Fault Circuit Interrupters (GFCI) should be placed on all delicate electrical equipment and on all electrical outlets within arms' reach of faucets.
- 3) Key locks should secure high voltage equipment.
- 4) Master shutoffs should be conveniently located, easily accessible by the teacher and in proper working order.

Adapted from the Total Science Safety System by Jakel, Inc.

Appendix H

Chemical Procurement, Distribution, Storage, and Handling Guidelines

Precautions for the handling and use of hazardous chemicals include:

A. Ordering chemicals

- 1) Assess the hazards of the chemical before ordering. Order hazardous chemicals only if absolutely necessary and prior approval is obtained from the school CHO.
- 2) Chemicals should be ordered in small quantities.

B. Receiving chemicals

- 1) Do not allow incoming shipments of chemicals to be opened and transported by anyone other than trained personnel.
- 2) Make sure the chemical label contains the identity of the chemical, the concentration, and the hazard information.
- 3) Date chemicals as they arrive.
- 4) Make sure the chemical arrives with a Safety Data Sheet (SDS). If not, call the manufacturer or distributor to request one immediately.

C. Processing chemicals

- 1) Inventory chemicals annually and as chemicals are received, including their amounts and location, and assess for container and label integrity, hazards, decomposition, or water absorption by the chemical.
- 2) Chemicals may only be checked out and used by employees after proper training.

D. Storing and handling of hazardous chemicals

- 1) Chemicals not considered "hazardous" by this document should be stored in their original container with their original label intact.
- 2) Chemicals should be stored by chemical families in ventilated storerooms.
- 3) All chemicals should be properly labeled with the appropriate NFPA or GHS hazard warning labels.
- 4) Each chemical solution (made for use in the lab) should be labeled with the identity of the chemical, date, concentration, name of preparer, and a NFPA or GHS hazard warning label.
- 5) The chemical storage area should be separate from the lab or classroom and secured. Only qualified personnel should be allowed in this area.
- 6) Corrosives and poisons should be stored in appropriate cabinets.
- 7) Flammables should not be stored outside an approved ventilated flammables storage cabinet unless in safety cans. No more than 1 liter of a flammable liquid is permitted in the lab without a safety can.
- 8) Special storage should be available for incompatibles such as nitric acid and ammonium nitrate.
- 9) Caustic liquids should be stored below waist level.
- 10) Chemicals should not be stored over, under, or near a sink.
- 11) Chemicals should not be stored on open shelves above eye level.

- 12) Chemicals should not be stored on the floor except in approved shipping containers.
- 13) The storage area and cabinets should be labeled identifying the hazardous nature of the products stored within, so that the fire department can quickly see a potentially hazardous area.
- 14) Shelving sections should be secured to wall or floor to prevent tipping of entire section.
- 15) Shelving should be equipped with lips or doors to prevent containers from rolling off.
- 16) PELs, STELs, TLVs should be monitored for hazardous chemicals when necessary and should not exceed the fume hood capabilities.
- 17) Acids should be separated from caustics and active metals like sodium, potassium, and magnesium as well as from those that can generate toxic gases such as iron sulfide and sodium cyanide.
- 18) Chemicals should be transported using appropriate carriers or chemical resistant carts.

E. Storage and handling requirements for compressed gases

- 1) Compressed gases should be handled as potential explosives.
- 2) Cylinder valve stems should be protected.
- 3) Cylinder valves should not be lubricated, modified, tampered with, or forced.
- 4) Gas cylinders should be protected from falling to prevent valve damage.
- 5) Exposure to heat should be avoided. Do not store cylinders in direct sunlight.
- 6) Cylinders of toxic, flammable, or reactive gases should be used only when the fume hood is operating.
- 7) Do not extinguish a flame involving a combustible gas until the gas is shut off - otherwise it can reignite - possibly causing an explosion.
- 8) Empty gas cylinders should be labeled "Empty" for proper disposal.

F. Storage and handling requirements for flammable chemicals

- 1) Store all flammables in a dedicated Flammables cabinet.
- 2) Keep flammable material cool (55° -80° F).
- 3) Store away from all sources of ignition.
- 4) Store away from all oxidizers.
- 5) Never store flammables in refrigerators unless the refrigerator is explosion proof.
- 6) Avoid storing any chemicals, especially flammables, in direct sunlight.
- 7) Never use flammable liquids near any source of ignition, spark, or open flame.
- 8) Only use flammable solids in very small quantities.

G. Storage and handling requirements for corrosive materials

- 1) Store all corrosives in appropriate corrosives cabinets.
- 2) Working with corrosives requires special eyewear. Wear a chemical splash face shield when pouring large quantities of full-strength corrosive materials.
- 3) Inspect all shelves and shelf clips in acid cabinets every three months for corrosion to prevent collapsing.
- 4) If possible, keep chemicals, such as acids and bases, in the original shipping package (Styrofoam cubes).

H. Management of extremely hazardous chemicals

- 1) Use the fume hood when the PEL (permissible exposure limit) for a chemical is less than 50 ppm as indicated on the chemical SDS.
- 2) Use carcinogens, mutagens, teratogens, and allergens only under a fume hood.
- 3) Handle toxics, corrosives, flammables, and other noxious chemicals under a fume hood.
- 4) Water reactive solids should be stored under dry oil.
- 5) Use extreme caution when handling finely divided (dust-like) material which may form explosive mixtures with air.
- 6) Peroxide forming chemicals such as ethyl ether are kept in airtight containers in cool dry locations and disposed of properly before the shelf life is exceeded.

I. Prior approval procedures regarding chemicals

- 1) All hazardous chemical orders must be approved by the school CHO. Examples of hazardous chemicals are listed in **Appendices D** and **E**.
- 2) The following chemicals should not be maintained as part of school lab inventory unless prior approval is obtained:
 - a) Extremely hazardous substances
 - b) Water reactive materials such as alkali metals
 - c) Peroxide forming chemicals such as ethyl ether

Adapted from the Total Science Safety System by Jakel, Inc.

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Appendix I

Maintenance Log

Print the following maintenance logs and attach to clipboards on or near the item or area to be inspected. Maintain all records and store in the school's science department office. If a problem exists, submit a work order request form to the principal or designee of the school.

Maintenance logs are included for the following items and areas:

- Any eyewash should provide adequate water flow.
- A safety shower should provide adequate water flow.
- Fire blanket should be checked for accessibility and wear.
- Goggles, demonstration shields, and face shields should be checked for deterioration and scratches.
- Storage areas

The following should be checked monthly by qualified school or contracted personnel who will maintain the records.

- Fire extinguisher.
- Emergency lighting.

The following should be checked each semester by the county maintenance department who will maintain the records. The school CHO or principal should send a request each semester to the county maintenance department when the inspections are to be completed.

- Lab and chemical storeroom ventilation
- Electrical circuits will be tested using approved circuit testers
- Laboratory fume hood(s) and ducts

Deficient or inoperative equipment should be repaired by qualified personnel, replaced, or removed immediately. If a repair or replacement cannot be made immediately, a work order request form should be completed at once and sent to the proper school personnel. (See **Appendix J** for a work order request process).

Chemical Hygiene Plan: Maintenance Log

Weekly: Eyewash

Indicate date eyewash was inspected, who inspected the equipment, is it in proper working condition, and if not, date that maintenance was requested.

Date	Initials	Functioning Properly	Maintenance Requested	Date	Initials	Functioning Properly	Maintenance Requested
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	
		Yes No				Yes No	

Chemical Hygiene Plan: Maintenance Log

Quarterly: Safety Shower

Indicate date safety shower was inspected, who inspected the equipment, is it in proper working condition, and if not, date that maintenance was requested.

Date	Initials	Functioning Properly	Maintenance Requested	Special Notes
		Yes No		
		Yes No		
		Yes No		
		Yes No		
		Yes No		
		Yes No		

Quarterly: Fire Blanket

Indicate date fire blanket was inspected, who inspected the equipment, is it in proper working condition, and if not, date that maintenance was requested.

Date	Initials	Functioning Properly	Maintenance Requested	Special Notes
		Yes No		
		Yes No		
		Yes No		
		Yes No		
		Yes No		
		Yes No		

Quarterly: Goggles/Demonstration Shields/Face Shields

Indicate date safety equipment was inspected, who inspected the equipment, is it in proper working condition, and if not, date that maintenance was requested.

Date	Initials	Functioning Properly	Maintenance Requested	Special Notes
		Yes No		
		Yes No		
		Yes No		
		Yes No		
		Yes No		
		Yes No		

Quarterly: Storage Area

Indicate date storage area was inspected, who inspected the area, were there any problems, and if so, date that maintenance was requested.

Date	Initials	Problems Noted	Maintenance Requested	Special Notes
		Yes No		
		Yes No		
		Yes No		
		Yes No		
		Yes No		
		Yes No		

Quarterly: Gas Locks

Indicate date gas locks were inspected, who inspected the locks, were there any problems, and if so, date that maintenance was requested.

Date	Initials	Problems Noted	Maintenance Requested	Special Notes
		Yes No		
		Yes No		
		Yes No		
		Yes No		
		Yes No		
		Yes No		

Quarterly: Fume Hoods

Indicate date fume hoods were inspected, who inspected the hoods, were there any problems, and if so, date that maintenance was requested.

Date	Initials	Problems Noted	Maintenance Requested	Special Notes
		Yes No		
		Yes No		
		Yes No		
		Yes No		
		Yes No		
		Yes No		

Appendix J

Maintenance: Submitting a Work Order

Routine maintenance services are requested electronically through the Maintenance system. Designees at all locations have been trained to use the system. This service connects through the internet.

These routine requests are reviewed daily, printed, and provided to the Maintenance Shop Foreman. He will then assign the work request for each trade involved, to the Maintenance technicians.

SUBMITTING A WORK ORDER REQUEST

Each school has a designated person and a back-up person who is responsible for submitting work orders. Only if the designated person is out, should the back-up person submit orders. This lessens the chance of duplicating work orders.

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Appendix K

Chemical Hygiene Plan Training Program for Teachers

Chemical Hygiene Plan Training will include the following elements.

- **Location and Availability of the...**
 - Hazard Communication Standard OSHA 1910.1200 Rev. 2012 (Optional for lab employees)
 - HazCom Program including list of hazardous chemicals and SDSs (Optional for lab employees)
 - Laboratory Standard OSHA 1910.1450
 - Chemical Hygiene Plan and Responsible Personnel

- **Requirements of the...**
 - Hazard Communication Standard OSHA 1910.1200 Rev. 2012 (Optional for lab employees)
 - Laboratory Standard OSHA 1910.1450

- **Work Operations where hazardous chemicals are present**
 - School bus garages
 - Maintenance
 - Grounds keeping
 - Custodial
 - Vocational shop areas
 - Art areas
 - Science labs (evaluated cumulative total quantity stored)

- **Labels**
 - Contents
 - Requirements
 - Types:
 - Manufacturer's labels
 - GHS/Pictograms
 - Symbol warnings (NFPA and HMIG)
 - Labels for
 - Solutions made in lab or substances transferred in lab
 - Temporary containers
 - Alternative labeling
 - Consumer products
 - Warning Signs

- **Safety Data Sheets**
 - Sections 1-3: Chemical Identity and Hazardous Components
 - Define hazardous chemicals
 - Physical and health hazards of chemicals used (by chemical category)
 - exposure levels (PELs and TLVs)

- Section 4: First-Aid Measures
 - Signs and symptoms of overexposure
 - First aid procedures
 - First aid kit
 - Access to trained personnel
 - Accident reporting
 - Medical consultations and exams
 - Employer provides medical attn and follow-up exams
 - Licensed physician
 - Info to physician
 - Physician's written opinion
 - Recordkeeping
- Section 5: Fire-Fighting Measures
 - Definitions
 - Classes of fire
 - Container size limits
 - Extinguishing media
 - Firefighting procedures
- Section 6: Accidental Release Measures
 - Spill and Leak Procedures
 - Waste Disposal
- Section 7: Handling & Storage
 - Safe handling of hazardous chemicals
 - Contact hazards
 - Corrosives
 - Flammables
 - Highly Reactive Chemicals
 - Highly Toxic Chemicals
 - Chemical Storage
 - Ordering chemicals
 - Receiving chemicals
 - Storage Room including security, shelving, ventilation, fire protection
 - Storage Pattern - arrangement of chemicals
 - Separating incompatibles
- Section 8: Control Measures
 - Personal Protective Equipment/Safety equipment
 - Glasses/goggles/contact lenses
 - Face shields
 - Eyewash / shower
 - Demo shield
 - Gloves
 - Aprons/coats
 - Ventilation/fume hoods
 - Lab design

CHP Appendices – Lee County Schools

- Inspections
- Standard Operating Procedures
- Prior approval procedures
- Training Program
- Section 9: Physical & Chemical Properties
 - Detection methods for the presence or release of hazardous chemicals
- Section 10: Stability & Reactivity
- Section 11: Toxicological Information
- Section 12-15: Not Regulated by OSHA
- Section 16: Preparer's Information and Date of last revision

Source: The Science House, NCSU

Lee County Schools Training Documentation Form

On this date _____, the following Science Department employees of the Lee County School System received CHP training and understand chemical hazards in their work area and how to address them:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Chemical lab procedures which present serious hazards require prior approval from the School Chemical Hygiene Officer.

Training provided by: _____

Appendix L Emergency Action Response Plan

Teacher's Name _____ Classroom _____

1. Where is the closest phone? _____
2. Who should I call first? (depending on severity: 911, if life or death, or the principal) _____
3. Who should I get for CPR/First Aid? _____
4. Who are your student runners?

Class Period	Student Name(s)
1 st	
2 nd	
3 rd	
4 th	

5. Who is the runner supposed to contact (principal, dept. chair, another teacher, etc...)? _____
6. Which teacher can watch your class? _____
7. Which room contains the first responders' kit? _____
8. Where is the closest fire extinguisher? _____

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Appendix M Regulations for Animals in the Classroom

Lee County Schools Auxiliary Services - Safe Schools	Ref. Pets in the Classrooms	A-4170
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REGULATIONS FOR PETS IN CLASSROOMS

- Limit the number of warm-blooded animals to one per classroom, except upon advance approval of the school principal a maximum of two per classroom may be allowed.
- Keep animals in proper cages at all times except when being used for a planned classroom lesson.
- Animals should not roam free except for short exercise sessions when students are not in the room (and only if the animal is litter trained.)
- Cages must be cleaned daily by the teacher or other consenting adult.
- Parents must be informed that pets are in the classroom and written permission given for children to handle the pets.
- Prior approval to have a pet must be received from the school principal by completing the Pets in the Classroom Approval Form A-4170-A.
- Over extended vacations, how and by whom, the animal will be cared for should be approved by the principal on the Pets in the Classroom Approval Form A-4170-A.
- If a child is allergic to the pet(s), the teacher will work with the principal to resolve the matter. Generally, this means the pet must be removed from the classroom.

Approved by the Superintendent: January 27, 2001

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Appendix N

Biosafety Levels in Microbiology Labs

Biosafety Level 1 is suitable for work involving well-characterized agents not known to consistently cause disease in healthy adult humans, and of minimal potential hazard to laboratory personnel and the environment. The laboratory is not necessarily separated from the general traffic patterns in the building. Work is generally conducted on open bench tops using standard microbiological practices. Special containment equipment or facility design is neither required nor generally used. Laboratory personnel have specific training in the procedures conducted in the laboratory and are supervised by a scientist with general training in microbiology or a related science.

The following standard and special practices, safety equipment and facilities apply to agents assigned to Biosafety Level 1:

A. *Standard Microbiological Practices*

1. Access to the laboratory is limited or restricted at the discretion of the laboratory director when experiments or work with cultures and specimens are in progress.
2. Persons wash their hands after they handle viable materials, after removing gloves, and before leaving the laboratory.
3. Eating, drinking, smoking, handling contact lenses, applying cosmetics, and storing food for human use are not permitted in the work areas. Persons who wear contact lenses in laboratories should also wear goggles or a face shield. Food is stored outside the work area in cabinets or refrigerators designated and used for this purpose only. (In addition, microbiological specimens and/or media are prohibited from storage in regular refrigerators where food would be placed for human consumption).
4. Mouth pipetting is prohibited; mechanical pipetting devices are used.
5. Policies for the safe handling of sharps are instituted.
6. All procedures are performed carefully to minimize the creation of splashes or aerosols.
7. Work surfaces are decontaminated at least once a day and after any spill of viable material.
8. All cultures, stocks, and other regulated wastes are decontaminated before disposal by an approved decontamination method such as autoclaving. Materials to be decontaminated outside of the immediate laboratory are to be placed in a durable, leak proof container and closed for transport from the laboratory. Materials to be decontaminated outside of the immediate laboratory are packaged in accordance with applicable local, state, and federal regulations before removal from the facility.
9. A biohazard sign can be posted at the entrance to the laboratory whenever infectious agents are present. The sign may include the name of the agent(s) in use and the name and phone number of the investigator.
10. An insect and rodent control program is in effect.

B. *Special Practices*: None

C. *Safety Equipment (Primary Barriers)*

1. Special containment devices or equipment such as a biological safety cabinet are generally not required for manipulations of agents assigned to Biosafety Level 1.
2. It is recommended that laboratory coats, gowns, or uniforms be worn to prevent contamination or soiling of street clothes.
3. Gloves should be worn if the skin on the hands is broken or if a rash is present. Alternatives to powdered latex gloves should be available.
4. Protective eyewear should be worn for conduct of procedures in which splashes of microorganisms or other hazardous materials is anticipated.

D. Laboratory Facilities (Secondary Barriers)

1. Laboratories should have doors for access control.
2. Each laboratory contains a sink for hand washing.
3. The laboratory is designed so that it can be easily cleaned.
4. Bench tops are impervious to water and are resistant to moderate heat and the organic solvents, acids, alkalis, and chemicals used to decontaminate the work surface and equipment.
5. Laboratory furniture is capable of supporting anticipated loading and uses. Spaces between benches, cabinets, and equipment are accessible for cleaning.
6. If the laboratory has windows that open to the exterior, they are fitted with fly screens.

Resource: CDC – Center for disease Control
<http://www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4s3.htm>

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Appendix O

List of District and School Chemical Hygiene Officers

I. District Chemical Hygiene Officer

- A. Dr. Jim Atkinson, Custodial/Safety Advisor for Lee County Schools**
- B. Dr. Tina Poltrock, Director of Secondary Education**

II. School Chemical Hygiene Officers

A. High Schools

- 1. Lee Early College – Rodney Schmitz**
- 2. Lee County High School – Jalynn McDonald**
- 3. Southern Lee High School – Rob Newman**

B. Middle Schools

- 1. East Lee Middle School – Mike Williams**
- 2. SanLee Middle School – Kenna Wilson**
- 3. West Lee Middle School – Monika Kerner**

C. Alternative School

- 1. Bragg Street Academy- Eric Belk**

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Appendix P
District Chemical Hygiene Plan Review Committee
Signature Page

Committee Member	Role	School or Organization	Signature
Dr. Andy Bryan	Associate Superintendent C&I	Lee County Schools	
Dr. Jim Atkinson	Associate Superintendent for Auxiliary Services	Lee County Schools	
Janet Cameron	Teacher	West Lee Middle School	
Julie Randolph	Teacher	Southern Lee High School	
Stephen Roman	Teacher	Lee County High School	
Sonja Calderara	Essentially Science Coach	Lee County Schools	
Glenda Jones	Asst. Superintendent, Human Resources LCS		
Wayne Mosley	Chemist & Owner, Green Technologies		

The Lee County Schools Chemical Hygiene Plan was submitted to the Lee County Schools Board of Education for approval on .

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Appendix Q

Glossary

Action Level – The exposure level (concentration of material in air) at which OSHA regulations to protect employees take effect (29 CFR 1910).

Carcinogen – A material that has either been found to cause cancer in humans or to cause cancer in animals and therefore is considered capable of causing cancer in humans.

Ceiling limit – The concentration that should not be exceeded during any part of the working exposure.

CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act

CFR – Code of Federal Regulations. A collection of the regulations established by law.

Chemical Hygiene Officer – The employee who is designated by the employer to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan

Combustible – A term used by the NFPA, DOT, and others to classify certain liquids that will burn on a basis of flash points.

COR - Corrosion effects

Corrosive - A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact.

Designated area - An area which may be used for work with substances which have a high degree of acute toxicity and burn rapidly.

DOT - US Department of Transportation

EPA - Environmental Protection Agency

Explosive Limits – The concentration in air of a chemical in the workplace that is thought to be acceptable.

Extremely Hazardous Substance (EHS) - A substance listed in 40 CFR 355 (Appendices A and B).

Employee – An individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments.

Flammable – Describes any solid, liquid, vapor, or gas that will ignite easily and burn rapidly.

Flammable limits – The minimum and maximum concentrations of a flammable gas or vapor between which ignition can occur.

Flash point (FP) – The minimum temperature at which a liquid gives off sufficient concentration to ignite

FR - The Federal Register

CHP Appendices – Lee County Schools

Hazardous Chemical - A chemical for which there is evidence based on at least one study that is conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees.

HCS - Hazard Communication Standard (29 CFR 1910.1200).

Infectious Agents – substances that cause infections either by inhalation, ingestion, or direct contact with the host material.

Irritant - A chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact.

LD₅₀ - Lethal Dose 50. The dose that causes in death in 50% of the animals exposed by ingestion.

Laboratory – a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis

Mg/m³ – milligrams per cubic meter of air

NFPA – National Fire Protection Association

NTP- National Toxicology Program

OSHA - Occupational Safety and Health Administration. The regulatory and enforcement agency for safety and health in most US industrial sectors.

PEL – Permissible Exposure Limit. The legally allowed concentration in the workplace that is considered a safe level of exposure for an 8-hour shift, 40 hours per week.

Personal Hygiene – precautionary measures taken to maintain good health when exposed to potentially harmful materials.

PPE – Personal Protective Equipment

Release - the spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles) of any hazardous substance.

Reportable Quantity (RQ) - the quantity of a hazardous chemical that when released into the environment is subject to reporting. (40 CFR 302, Table 302.4)

SDS – Safety Data Sheet. A document required to be developed under 29 CFR 1910.1200 for hazardous chemicals.

Sensitizer - A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

Source Reduction - a practice that reduces the amount of any hazardous substance, pollutant, or contaminant entering a waste stream or otherwise released into the environment prior to recycling, treatment, or disposal; and reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.

CHP Appendices – Lee County Schools

TLV – Threshold Limit Value. The amount of exposure allowable for an employee in an 8-hour day.

Toxic – describes the ability of a material to injure biological tissue. (40 CFR 372.65)

Water-reactive - a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.