

Chemical Hygiene & Laboratory Safety Plan for Clay County School District

**A Guide to Policies
and
Procedures in the Science Curriculum
Grades K-12
School District of Clay County**

**Includes the Florida Dept. of Education
support information*



TABLE OF CONTENTS

Overview	1
A. General Principles for Work with Laboratory Chemicals	1
Chemical Hygiene Definitions.....	2
B. Responsibilities of School Personnel	3
C. Laboratory Facilities	4
Emergency Communication Systems	4
Shower & Eye Wash Equipment	4
Laboratory Ventilation & Hoods	4
D. Components of the Chemical Hygiene Plan	6
Chemical Procurement, Distribution & Storage	6
Personal Protective Equipment	7
Housekeeping, Storage, Maintenance & Inspections	7
Signs & Labels	9
Spills & Accident	9
Laboratory Information & Training Program	10
Waste Disposal Program	11
E. General Procedures for Working With Chemicals	12
Basic Rules and Procedures for Working with Chemicals	12
F. Safety Recommendations	12
G. Safety Data Sheets	15
Appendix A. Laboratory Safety Contract	16
Appendix B. Prohibited Chemicals	17
Appendix C. Spill Kit	18
Appendix D. Laboratory Hazards & Emergency Actions	19
Appendix E. Safety Checklists for Classroom.	20
Appendix F. Industrial Color-Coding and Storage	21
Appendix G. Hazard Communication Standard Pictograms	22
Appendix H. GHS-Compliant Label	23
Appendix I. Chemical Disposal Form	24

Appendix J. SOP Type: Accident - Hazardous Materials.....25

Appendix K. SOP Type: Chemical Spills.....26

Appendix L. SOP Type: Lockdown Stage 2.....27

Appendix M. SOP Type: Evacuation.....28-29

CHEMICAL HYGIENE & LABORATORY SAFETY PLAN FOR CLAY COUNTY SCHOOL DISTRICT

Overview

The following Chemical Hygiene & Laboratory Safety Plan (CHLSP) was developed by the Clay County School District to outline protocols to safeguard laboratory workers in school biological and chemical laboratories. This CHLSP complies with the Occupation Safety & Health Administration's (OSHA), Title 29 Code of Federal Regulations (CFR), Part 1910.1450, "Occupational Exposure to Hazardous Chemicals in Laboratories." The OSHA laboratory rules apply to all who engage in the laboratory use of hazardous chemicals. The purpose of the rules is to assure that all laboratory worker exposure to hazardous chemicals is below certain Permissible Exposure Limits (PELs) for substances specified in 29 CFR Part 1910, Subpart Z.

Moreover, the CHLSP has been designed to accompany the "Florida's Environmental Compliance Assistance for Chemical Management in School Facilities" guidance document written cooperatively under The Environmental Protection Agency's (EPA's) School Chemical Cleanout Campaign (SC3) program in partnership with the Department of Education and the Department of Environmental Protection. The information in this guidance document is intended to assist school personnel in creating a chemically safe school environment where chemicals are purchased wisely, stored safely, handled by trained staff and disposed of properly.

To build students knowledge of the physical and chemical characteristics of the world, most if not all, high school and middle school science laboratories use dozens of potentially hazardous chemicals while conducting hands-on laboratory experiments. Unfortunately, hands-on laboratory work with hazardous chemicals can put students and school staff at risk to exposure, accidents and injuries; if the chemicals are mishandled, inappropriately used or have degraded due to age. Consequently, the Clay County School District recognizes the need for a CHLSP to implement work procedures and safety practices that protect students and staff from the health hazards associated with handling hazardous chemicals in order to create a safe laboratory environment.

Anyone handling or working near hazardous chemicals in Clay County School District's elementary, junior and high schools' science laboratories are required to follow the written *Chemical Hygiene & Laboratory Safety Plan for Clay County School District*. This CHLSP specifies work practices, standard operating procedures, control methods, use of personal protective equipment and any special precautions necessary while working with hazardous substances in a school laboratory setting. This document is intended to strengthen teachers' knowledge of safety concerns so that they can model safety practices for their students to emulate.

A. GENERAL PRINCIPLES FOR WORK WITH LABORATORY CHEMICALS

The information contained in this document has been taken from OSHA 1910.1450 Appendix A which covers the National Research Council's (NRC) recommendations concerning chemical hygiene in laboratories. Appendix A is a non-mandatory guidance intended to assist in the development of a written Chemical Hygiene Plan, and was developed from a 1981 NRC publication called "Prudent Practices for Handling Hazardous." The update version of this publication is "Prudent Practices in the Laboratory; Handling and Disposal of Chemicals." A free copy of this book can be found at <http://www.nap.edu/catalog/4911.html>.

The primary goal of the CHLSP is to reduce, control or eliminate health hazards associated with hazardous chemicals in school laboratories. The recommended general principles or objectives to ensure worker protection from laboratory chemicals are to:

Minimize all chemical exposures through prescribed "general" precautions for laboratory chemicals rather than outlining specific guidelines for particular chemicals, while eye and skin contact should be avoided at all cost
Avoid underestimation of risk through the assumption that all substances of unknown toxicity are toxic
Provide adequate ventilation by use of fume hood and other precautionary devices
Institute a chemical hygiene program as a regular and continuing effort; and

Observe OSHA's Permissible Exposure Limits (PEL's) and Threshold Limit Values (TLV's) as outlined by the American Conference of Governmental Industrial Hygienists.

Over and above the OSHA requirements, the Clay County School District general principle mandates for working with laboratory chemicals require staff to:

- Classify and store chemicals in a compatible manner
- Properly label and disposal of hazardous materials/wastes
- Inventory chemicals annually
- Provide and maintain adequate up-to-date safety equipment; and
- Respond in a timely responsible manner to reported safety concerns.

Chemical Hygiene Plan Definitions

Chemical Hygiene Officer means an employee who is designated by the administration, and who is qualified by training or experience, to provide technical guidance in the development and implementation of a Chemical Hygiene Plan.

Chemical Hygiene Plan means a written program developed by the school Health & Safety Office experts to sets forth procedures, equipment, personal protective equipment and work practices that are capable of protecting students and staff from health hazards presented by hazardous chemicals used in school laboratories.

Emergency means any occurrence, such as, equipment failure, rupture of containers or failure of control equipment which results in an uncontrolled release of a hazardous chemical into the laboratory.

Explosive means a chemical that causes a sudden, almost instantaneous release of pressure, gas and heat when subjected to sudden shock, pressure or high temperature.

Hazardous Chemical means a chemical that exhibits acute or chronic health affects under OHSA 29 CFR Part 1910.1200, Hazard Communication Standard; Appendices A and B provides further guidance in defining the scope of health hazards and determining if a chemical is considered hazardous.

Laboratory means a facility where the "laboratory use of potentially hazardous chemicals" occurs, which typically entails the use of small quantities of potentially hazardous chemicals in an area where scientific experimentation is being conducted.

Laboratory Scale means working with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person.

Fume Hood means a laboratory device: enclosed with a front moveable sash (window) made out of safety glass; constructed and maintained to draw air from the laboratory; to prevent or minimize the escape of air contaminants into the laboratory; and to allow chemical manipulation to be conducted in the enclosure without insertion of any portion of the laboratory worker's body other than arms and hands.

Laboratory Use of Hazardous Chemicals means handling or use of chemicals in which all of the following conditions are met:

"Laboratory Scale" chemical manipulations

Multiple chemical procedures or chemicals used; and

Protective laboratory practices and equipment are available and in common use to minimize the potential for student/teacher exposure to hazardous chemicals.

Physical Hazard means a hazard that is a combustible liquid, compressed gas, explosive, flammable liquid or solid, organic peroxide, oxidizer, pyrophoric material (spontaneous ignition in air), and unstable (reactive) or water reactive material.

Permissible Exposure Limits (PELs) OSHA-PELs tells you how much of an air contaminant, under 29 CFR Part 1910, Subpart Z, a worker can be exposed to for 8 hours per day, 40 hours per week over a 30 year period without suffering adverse health effects. PELs are recommended standards that merely serve as a warning, because most chemicals are not tested for long-term health hazards, reproductive effects and the potential to cause cancer to humans. The OSHA 29 CFR 1910, Subpart Z substances are found at:

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10147

Unstable (or reactive) means a chemical in the pure state that will vigorously polymerize, decompose, condense or become self-reactive under conditions of shock, pressure or temperature.

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

Threshold Limit Values (TLV's) are American Conference of Governmental Industrial Hygienist (ACGIH) exposure standards that are expressed in 3 ways: TLV-TWA is the Time-Weighted Average concentration for a normal 8-hour workday or 40 hour work week; TVL-STL is the Short-Term Exposure Limit or maximum concentration for 15-

minute exposure with 4-periods in a workday with 60 minutes between exposures, never to exceed TVL-TWA; TVL-C is the Ceiling Limit or the amount that should never be exceeded. TVLs are the same as PELs in the respects that they are recommended standards that merely serve as a warning, because most chemicals are not tested for long-term health hazards, reproductive effects and the potential to cause cancer to humans.

B. RESPONSIBILITIES OF SCHOOL PERSONNEL

Overall, the responsibility for chemical hygiene rests at all levels of staff within the school system, however, the Superintendent and upper level administrators hold the ultimate responsibility to provide continuing support for school chemical hygiene. Physically, the School District of Clay County's Academic Support Department (ASD) is the delegated administrator of the chemical hygiene program and is responsible to work with Principals/School Site Managers, designated Chemical Hygiene Officers and Science Teachers with regards to chemical hygiene in school laboratories. The ASD is also responsible to implement the appropriate chemical hygiene policies and practices in order to monitor purchases, use and disposal of chemicals used in the laboratory as well as the authority to conduct all formal laboratory audits.

The school Principal/ Site Administrator is responsible for: providing continuing support by ensuring the requirements of this CHLSP are followed; assigning a Chemical Hygiene Officer and training all appropriate staff in laboratory safety protocols found in this guidance. The Chemical Hygiene Officer is directly responsible for all chemical hygiene concerns in school science laboratories. The ASD will maintain a list of all Chemical Hygiene Officers who will be responsible for: procurements, usage and disposal of chemicals used in school laboratory programs and will have the authority to conduct and document all informal laboratory audits.

The designated Chemical Hygiene Officer is required to:

Ensure students and staff know and follow the Clay County School District's CHLSP

Verify all chemical stockrooms/storerooms are adequate and well ventilated

Assure the appropriate Personal Protective Equipment(PPE) is available and in working order

Determine the required levels of Personal Protective Equipment (PPE)

Conduct routine housekeeping inspections with a checklist (APPENDIX E)

Maintain documents/records of all routine inspections and condition of the emergency equipment

Document in writing all identified facility or equipment problems to ASD and Principal promptly

Provide access to reference material to include all Safety Data Sheets (SDSs)

Ensure that an annual inventory of laboratory chemicals is completed or updated

Train teachers and students in the proper use of all assigned emergency safety devices, equipment and procedures to include: eyewashes, emergency showers, fire extinguishers, spill kits, first aid kits, emergency shutoffs, emergency escape routes, etc.

Review the curriculum experiments for adequacy and appropriateness

Train all Science Teachers prior to the introduction of new chemicals, new procedures, new experiments, substantially modified procedures and experiments, or unique new equipment(s); and

Provide First Aid, CPR and "hands-on" fire extinguisher training to Science Teachers.

The Laboratory Supervisor or in other words the Science Teacher, if not the Chemical Hygiene Officer is responsible for laboratory oversight to:

Plan and conduct activities according to the CHLSP

Ensure students are knowledgeable with the CHLSP policies and practices

Impose use of (PPE) and equipment in the laboratory

Ensure scale of work is suitable to the physical facilities available; and

Report all facility and equipment problems immediately to the principal and/or the building administrator.

Appendix A, found in the back of this document, is a Laboratory Safety Contract that is required to be signed by both student and parents, and is to be returned to the Science Teacher before any laboratory experiments are conducted. As part of this contractual agreement, the student consents to wear proper attire and all PPE during laboratory work. At the time the contract is passed out, is when the Science Teacher should fully explain the consequences and penalties of noncompliance with the safety practices. Henceforth, continuously reinforce and review of safety policies and practices

should be conducted. Science Teachers are responsible to keep all students' tests, contracts, and other information pertaining to safety education on file in the science classroom.

Lastly, it is the Science Teacher's responsible to hold the students accountable for following the proper safety procedures while handling laboratory chemicals in the classroom setting. To achieve this goal, the following objectives are recommended to assure student safety:

Adopt safety training strategies for students as a learning tool

Host student roundtable discussions to identify potential hazards

Include students in the planning of safety concerns and consequences

Maintain a copy of Appendix A, Laboratory Safety Contract signed by student and parents

Post a copy of Appendix A, Laboratory Safety Contract near telephone, doorways, fume hoods, sinks or other strategic area in the laboratory

Role-play various safety practices for particular curriculum experiments

Test students levels of understanding of safety practices and reteach, if needed

Student-created location diagrams of safety equipment and emergency telephone numbers

Demonstrate proper use of all the safety/emergency equipment in each laboratory; and

Impose punishment for safety policy violations.

C. LABORATORY FACILITIES

This CHLSP is not intended to address laboratory design but will give special attention to emergency alarms and communication systems; safety/shower/eye wash equipment; and laboratory ventilation and fume hood performance.

Emergency Communication Systems

Due to the potential for chemical accidents or releases that can affect other areas of the school, emergency response fire alarms and/or some sort of method to communicate with Main Office should be available. Local fire department telephone number and any access number to the outside should be posted near the laboratory telephone (that is able to reach an outside line), fume hoods, chemical storage doorways, exits, safety showers and fire extinguishers.

Shower & Eye Wash Equipment

The OSHA rules regarding emergency equipment does not adequately define what is considered "suitable facilities" for drenching eyes and body. Therefore, the American National Standards Institute (ANSI) promulgated the ANSI Z358.1-2004 provision to outline the installation; performance; use; and maintenance for emergency eye wash and shower equipment. Science Teachers should instruct all students in the location and proper use of safety showers, eye washes, eye/face washes, eye washes/drench hose and drench hose units.

A safety shower should be located within a 100 feet or 10 seconds walking distance from any location within the room. The shower area must be clearly labeled and kept clear of any obstructions. A large ring on a chain when pulled should readily open the valve of the shower allowing 20 gallon of potable lukewarm water per minute for 15 minutes. Eye washes require a controlled 0.4 gallons of water per minute for 15 minutes to rinse both eyes without injuring the user. Eyes/face washes require a controlled 3.0 gallons of water per minute for 15 minutes to rinse both eyes/face without injuring the user.

The ANSI standards allow drench hose units to supplement eye washes with a 3 gallon per minute water flow, but these units may not be used in place of a dedicated eye wash unit. ANSI standards also require all of the above emergency equipment to be activated weekly to ensure they are in proper working order. These weekly tests are required to be documented on an affixed tag attached to the plumbing system. In accordance with OSHA, maintenance of eye wash units should be inspected quarterly for problems, while other safety equipment should be inspected every 3 to 6 months.

Laboratory Ventilation & Hoods

As with any laboratory safety equipment, the Science Teacher is required to instruct the students in their location and proper usage. The design of the laboratory should facilitate general ventilation for air intake and exhaust to avoid intake of contaminated air and the recirculation of air exhausted from laboratory hoods. However, the ventilation

system should not be relied upon for protection from toxic substances released into the laboratory. As well, all stockrooms and chemical storage areas are required to be well ventilated.

Maintenance of all ventilation or related equipment should undergo continuous evaluation and/or modification, if considered inadequate. The ventilation rate should be monitored at least every 3 months and reevaluated whenever any changes/modification has been made to the unit. Substances released into the air of the laboratory should be continually replaced to prevent the increase of hazardous contaminants. Direct air flow into the laboratory should be from non-laboratory areas to an exhaust system leading directly to the outside of the building. General air flow should not be turbulent but relatively uniform throughout the laboratory with no high velocity or static areas.

The National Fire Protection Association rules, NFPA 45, "Standard on Fire Protection for Laboratories Using Chemicals" apply to laboratory air supply systems for the identification, inspection and maintenance of laboratory ventilation systems and hood(s). The NFPA 45 rules require the following inspection/tests: visual inspection of the physical condition of the ventilation system and hood interior, sash and ductwork; measurement of hood airflow (test and balance); face velocity test verification of inward airflow over the entire hood face; and changes in work area conditions that could affect hood performance or overall laboratory ventilation. The quality and quantity of ventilation should be evaluated upon installation, regularly monitored annually and re-evaluated when the ventilation system is modified.

According to OSHA, a laboratory hood should allow 2.5 linear feet of hood space per person and should be accommodate 2 workers at a time who are working with hazardous chemicals. Work conducted under the hood should be at least 6 inches from the front edge of the hood. Rule of thumb, the suggested ventilation rate of 4-12 room air changes per hour is considered adequate general ventilation. When not working under the fume hood, the hood sash should be kept closed at all times. Keep materials stored under the hood to a minimum and do not allow them to block vents or air flow. Leave hood "on" when it is not in active use if toxic substances are stored under the hood.

Velocity of the hood face should be between 60 to 100 linear feet per minute; however this face velocity should never be relied upon as an indicator for laboratory hood performance. OSHA suggests to use a fume hood when working with any volatile substance with a TLV of less than 50 parts per million. This information can be found on the Material Safety Data Sheets. The American Chemical Society's suggested reference is Saunders' "Laboratory Fume Hoods: A User's Manual." However, ANSI Z9.5, "Laboratory Ventilation" rules also provide further useful information.

Clay County School District outlines their laboratory equipment policy below:

Emergency Exhaust System is required in every science room with a manual switch to turn on the emergency exhaust system that is clearly labeled with a permanent sign.

Goggle Sanitizing Cabinet is required by the State of Florida for students whom are required to use personal eye protection in accordance with the American National Standard Institute (ANSI) Z87.1-1979 standards for use, durability, and cleaning. Science Teachers and students must wear goggles in the laboratory at all times with the exception of pre-lab discussion. Appropriate chemical resistant goggles can be purchased through your school's science supply budget. Contact lenses should not be worn in the laboratory. If wearing contacts is unavoidable, the use of non-vented chemical splash goggles is required. Goggles must be sanitized between uses by a goggle sanitizing cabinet.

Eye Wash & Shower Stations are required to be located by signs posted in the lab identifying the unit. Eye wash and shower stations are required for every science room, laboratory or shop where students handle materials or chemicals that are potentially dangerous to human tissue. All students should be instructed in the use of the eye wash and shower stations. All safety equipment should not be blocked by debris, be in proper working condition and clearly labeled with instructions for use. Electrical outlets within six (6) feet of any water supply must be **Ground Fault Circuit Interrupter (GFCI)**.

Fire Blanket is to be mounted on a wall or placed in a cabinet no more than five (5) feet from the floor, be visible and readily accessible. If placed in a cabinet, the cabinet must be clearly labeled "Fire Blanket."

Fire Extinguisher policy requires, at minimum, 2-ABC fire extinguishers mounted no more than five (5) feet from the floor, visible and readily accessible near exit doors. The extinguisher cannot be more than 50 feet from any laboratory stations and cannot be blocked by storage or furniture. The Science Teacher should inspect the condition of the fire extinguishers at least weekly and notify the ASD, maintenance or head custodian if the extinguisher appears to be

leaking, damaged, or discharged. Extinguishers should be recertified annually or in accordance with the type of fire extinguisher. Provide proper instruction on the use of a fire extinguisher to the class prior to the first laboratory exercise at the beginning of each school year. Annual recertification is outsourced by the District Operations Dept. **First Aid Kits** should be purchased by each school and be made available in the laboratories with their location clearly marked. The instructor should take inventory of the kit on a regular basis. The instructor and students should be aware of the proper use of the contents of the first-aid kit.

Fume Hood is used to prevent exposure to toxic, irritating, or noxious chemical vapors and gases as a source of positive ventilation and shut down when the emergency fan is turned on. It must be kept clean and contain minimal storage.

Shut off Switches for gas and electrical shut off are required to be clearly labeled and located in a non-lockable place accessible within 15 feet of the instructor's station to allow cut off of services. Valves must shut completely with one quarter (1/4) turn.

D. COMPONENTS OF THE CHEMICAL HYGIENE PLAN

According to OSHA, a Chemical Hygiene Plan (CHP) is written to: protect laboratory workers from health hazards associated with hazardous chemicals, keep exposures below specified limits and to have the CHP readily available for review upon request. OSHA believes that controlling a hazard at its source is the best way to protect a worker. In accordance with OSHA, the CHP shall include the following elements:

Standard Operating Procedures relevant to safety and health concerns that are to be followed when laboratory work involves the use of hazardous chemicals

Criteria necessary to implement control measures to reduce exposure to hazardous chemicals which is to include the use of personal protective equipment with particular attention to the selection of control measures for extremely hazardous chemicals

Properly functioning fume hoods and other protective equipment

Provide laboratory worker training

Specific laboratory procedures that require prior approval; and

Designation of a Chemical Hygiene Officer.

Chemical Procurement, Distribution & Storage

Before a substance is ordered and received, information on proper handling, storage and disposal should be known. Preferable all substance should be received in a central location. If a chemical is received without a manufacturer's label--do not accept it! No container should be accepted without an adequate identification label. No container is to be accepted without a label exhibiting the:

Identity of the hazardous chemical

Appropriate hazard warnings; and

Manufacturer's name and address.

By law, it is the manufacturer's responsibility to label containers appropriately. Make this information available to all staff involved in shipping, receiving, storage and distribution. Appendix B exhibits the list of "Prohibited Chemicals" by the Clay County School District.

Clay County School District acquisition policy requires that chemicals for lab work or demonstrations be ordered through the school. Acquiring chemicals through other means, including self-purchase by instructors or donations is strictly prohibited unless specifically approved by the ASD staff. Highly toxic chemicals of any nature are prohibited from use in schools.

Purchase the minimum amount of chemicals necessary for short-term use and distribution. If possible, purchase chemicals in class-size quantities only. Plan for the use of no more than one or two year's worth of chemicals. Do not stockpile chemicals, it is expensive and can be hazardous. Preferably, all hazardous chemicals should be received in a central location within the department and inspected before you sign the bill of lading.

The following guidelines must be followed when receiving and/or handling chemicals for the Clay County School District:

Never open a reagent package until the label has been read and completely understood

Mark all incoming chemicals with the date received and initials of person receiving the chemicals

Clearly label all chemical storage areas with labels or placards on front of access doors to warn occupants and emergency response personnel such as fire fighters or paramedics

Properly store flammable liquids in small quantities in an approved "Flammable Only" storage cabinet; and

Add the newly accepted chemical to the existing chemical inventory list.

Personal Protective Equipment (PPE)

PPE is defined as the use of specialized clothing and equipment designed to be worn by laboratory workers to protect them from direct exposure from health and safety hazards. Examples of these accessories are: safety goggles, face shields, hard hats, hearing protection, gloves, respirators, lab aprons/coats and proper footwear. Always avoid skin contact by using gloves and log sleeves. Wash hands and arms after working with hazardous chemicals.

Engineering controls are designed to eliminate or reduce exposure to a physical or chemical hazard through the use of machinery or equipment such as of fume hoods, respirators and adequate building ventilation. Administrative controls are changes in work policies and procedures to reduce duration, frequency and intensity of exposure to hazardous chemicals or hazardous conditions. A "Chemical Hygiene Plan" is considered an administrative control as well as best management practices, preventative maintenance policies, and routine inspections.

The preferred methods for reducing exposure in the laboratory, in order of general effectiveness are:

Substitution of less toxic or hazardous materials/chemicals

Engineering Controls

Administrative Controls; and/or PPE.

The recommended PPE for a particular chemical is found on its respective SDS. Keep in mind that PPE protects you from a hazard but does not remove the hazard from the work area.

General PPE requirements are found in OSHA's 29 CFR 1019.132 rules, which require a written hazard assessment in order to select the appropriate PPE for the particular laboratory activity. A written record to indicate each worker has been properly trained in PPE safety and equipment usage is required. The rules 29 CFR 1910.133, .134 138, and 1000 cover the OSHA requirements for Eye & Face; Respiratory; Hand Protection and Air Contaminants, respectively.

PPE should not be used as a substitute for engineering controls or work practices mandated through administrative controls to prevent exposure. As mentioned before, the above rules require the consideration of engineering and administrative controls, where possible, to achieve compliance, before selection and usage of proper PPE.

Housekeeping, Storage, Maintenance & Inspections

Laboratory floors should be cleaned regularly. Formal housekeeping and chemical hygiene inspections should be held at least semiannually. Use Appendix E Checklist for Safety Inspection Items, Science Labs, Classrooms, and Lab Preparation Areas Access to exits, emergency equipment and utility controls should never be blocked. All laboratory work areas should be cleaned and counter wiped, glassware washed and put away, and students hands washed before the leaving the classroom.

With regards to laboratory chemical storage, the amounts permitted should be as small as practical. Chemical storage on bench tops is not allowed and storage in fume hoods should be very minimal. Chemical exposure to heat or direct sunlight should be avoided. Storerooms should be segregated into well identified areas that are adequately ventilated. Highly toxic chemicals or opened containers should be in unbreakable containers or in secondary containment. Toxic substances should be segregated with regards to compatibility in a well-identified area with local exhaust ventilation. Highly toxic or other chemicals whose containers have been opened should be in unbreakable secondary containers. Stockrooms/storerooms should not be used for preparation or repackaging. When chemicals are hand carried, the container should be placed in an outside container/ bucket or carried with both hand while having one hand on the bottom of the container to laboratory stations.

Stored chemicals should be examined at minimum annually for replacement, deterioration and container integrity. Periodic inventories should be conducted with unneeded items going for appropriate disposal or return. Storerooms

holding hazardous chemicals should be under the control of the Science Teacher or Chemical Hygiene Officer and secured from entry to students and other building occupants.

Ideally, one chemical/biological storage room under the supervision of a qualified person is advisable. The storage room should have adequate security. Safety features for the facility should include:

Accessibility of approved fire extinguishers

Working emergency shower or eye/face wash

Forced ventilation from floor to ceiling with exhaust above roof level

Impervious shelving with half-inch lip, secured to wall with the top shelf below eye level

Explosion proof lighting and good illumination; and

Spill Kit items (Appendix C) and other clean-up materials.

Storage Room "DO'S":

Chemicals must be stored under lock and key when not in use

Chemicals must be stored in adequately labeled containers

Always store chemicals with labels in the forward, readable, position

Chemicals that are transferred into a another container must include the following information on the label: chemical name, formula, concentration, hazard warning, name or initials of person responsible for transfer

Flammable liquids and solids must be stored in a dedicated flammable storage cabinet

Use of secondary containment to limit spills and avoid incompatibility problem

Order chemicals in plastic containers or plastic-coated bottles to reduce breakage

Plan your storage to survive a catastrophic event by limiting the potential for spills and breakage

Return chemicals to their designated storage location promptly after use

Store corrosives acids in a locked acid locker vented to the outside

Isolate nitric acid within the acid storage cabinet by enclosing it in a high density polypropylene container because it not only is an acid but also an oxidizer

Keep lab shelves organized and compatible chemicals together

Do not permit unauthorized persons in the storage room; and

Ensure hazardous waste or by-products are stored properly before disposal.

Before leaving, secure open chemical containers, close and lock the flammable lockers, close and lock the acid lockers, and secure the chemical storage room/areas.

Store Room "DON'TS":

Chemical storage rooms and closets should not have open floor drains

Never grab a container from the top only, chemical containers should be carried with two hands

Don't use unlabeled chemicals

Don't permanently store chemicals in the fume hood

Don't store chemicals over, under or near a sink or drain

Don't mix chemicals in a sink

Don't store reagents and/or apparatus on the lab bench

Don't store chemicals on the floor

Don't block aisles with stored chemicals

Don't store chemicals above eye level or on top of cabinets

Don't dispose of broken glassware in trash with wrapping it

Don't store hazardous waste in the student work areas

Don't store chemicals alphabetically

Keep accurate records of the amount of all chemical product on hand; this inventory should be updated at least annually.

Regulations on chemical storage can be obtained from the Environmental Protection Agency (EPA), Uniform Fire Code (UFC), National Fire Protection Association (NFPA), Florida Fire Protection Agency (FFPA), and Occupational Health and Safety Administration (OSHA).

Signs and Labels

Signs and labels should be posted on:

Exits

Chemical storage areas

Areas approved for food and beverage consumption only

Location signs for eyewash stations, other safety and first aid kit

Warnings for areas or equipment where specials or unusual hazards exist

Labels identifying contents of containers, including waste receptacles; and

Emergency telephone numbers of emergency responders, ASD and Chemical Hygiene Officer

Place signs conspicuously in the laboratory and on refrigerators to warn occupants that:

No food or drink is permitted in the refrigerator

No food or drink is permitted in the laboratory; and

Hands must be washed before leaving the lab.

Original manufacturers' labels, by law, must be on all incoming chemicals under OSHA's Hazard Communication Standard. An SDS must be promptly reviewed and readily available in hard copy for all hazardous chemicals in storage. Laboratory users must be provided a copy of all SDSs within 15 days upon request. Stock solutions and reagents must be labeled with the name of the contents, their hazards, and the preparation date. Unlabeled container with unknown contents must be handled as hazardous waste. Disposal of unknown chemicals is very expensive.

Spills & Accidents

A spill control policy should be developed and include considerations for prevention, containment, cleanup and reporting for all releases and spills occurring in laboratories. The spill policy should include a one-page emergency plan to outline immediate response requirements. Proactive practice drill should be conducted so all students are familiar with the spill control and any accompanying emergency plan. There should be an alarm system to alert building occupants in all parts of the school. All accidents or near accidents should be reported so they can be analyzed so in the future so any similar situation can be avoided. In the event of a spill or release, the emergency circumstances should be communicated immediately to all personnel in the surrounding area and Main Office. At that time, all spill procedures should be implemented with regards to: evacuation, ventilation requirements, medical care, spill response and reporting.

Be prepared for accidents. Assure that at least 2 people are present at all times when working with hazardous chemicals. Breakable containers should be stored in chemical resistant trays so in the event of a release the secondary containment can be placed under the fume hood. If a major spill occurs outside the hood, evacuate the area and assure that cleanup personnel wear appropriate protective equipment.

Standard ABC fire extinguishers should be readily accessible in strategic areas in the laboratories and near hallway entrances of the laboratory. A smoke detector should be installed, at minimum, in each chemical storage area. And it is recommended that a pail of sand be located in the laboratories for emergency use.

Chemical spills and leaks can occur in any laboratory. In order to minimize injury to health, property, and fire, the supplies listed in Appendix C, Spill Kits must be on hand to deal for minor spills. Without risking personal safety, the clean up of a minor spill utilizing these supplies listed in Appendix C is allowed if wearing appropriate protective clothing. However, any major spill will require professional remediation.

If a spill of a hazardous chemical occurs: (Also, see School Emergency Plan SOP "IV-2 Accident-Hazardous Materials"; SOP "IV-10 Chemical Spills"; SOP "IV-15 Evacuation" and SOP "IV-38 Lockdown Stage 2")

Evacuate classroom immediately

Affected skin or clothing should go immediately under eye wash/shower/drenching unit

Avoid breathing the vapor if it is a liquid spill and turn on emergency exhaust

Notify an administrator & Chemical Hygiene Officer as soon as possible regarding the incident

Notify the health aide of any injuries

Follow the SDS's instructions for clean-up procedures

Follow the general procedures for using the Spill Kit listed in Appendix C; and

Deny access to the area until cleanup has been completed.

Emergency Protocols are found in Appendix D, Laboratory Hazards & Emergency Actions

Spills must be remediated after the room has been evacuated and the area stabilized, however, the safety of staff and students takes precedence

Know the correct evacuation routes

Know the location of the master shut-offs for gas and electrical power

Know what to do during a power outage

Events causing material damage but not effecting students must be attended to immediately, however, the safety of staff and students takes precedence at all times; and

Post emergency telephone numbers near all telephones.

Laboratory Information and Training Program

The aim of a laboratory Information & Training Program is to assure that all individuals at risk of chemical exposure in the laboratory are adequately informed about the chemicals they work with in the laboratory, risks involved with these chemicals and what to do if an accident occurs. With regards to emergency and PPE training, every laboratory worker should know the location and proper use of available protective apparel and equipment as well as emergency protocol required during a spill or release incident. All Science Teachers should be trained in the proper use of emergency equipment, spill/release procedures as well as first aid instruction.

ASD shall provide Science Teachers with pertinent information to ensure they are familiar with the hazards of chemicals found in their laboratories and storage areas. Scientific literature and ASD staff technical assistance concerning chemical hygiene will always be available. This information is to be provided before the initial work in the science laboratories begins or when working for the first time with a hazardous chemical. Any laboratory worker who works with hazardous chemicals in the County School District laboratories are required to know the contents of this CHLSP and be familiar with the content of the OSHA 29 CFR 1910.1450, "Occupational Exposure to Hazardous Chemicals in Laboratories."

All Chemical Hygiene Officer's and Science Teacher are required to be familiar with:

permissible exposure limits (PELs) for OSHA regulated substances found in 29 CFR Part 1910, Subpart Z for approximately 500 hazardous substances

Other recommended exposure limits not addressed by OSHA for chemical they use

Signs and symptoms associated with exposures to hazardous chemicals used in the laboratory; and

Location and availability of known reference material on hazards, safe handling, storage and disposal of hazardous chemicals found in the laboratory to include Material Safety Data Sheets received from chemicals suppliers or directly from the manufacturer.

The training part of this requirement is the familiarization of methods to detect the presence or release of a hazardous chemical such as visual appearance or odor of hazardous chemicals while being released; knowing the physical/health hazard used each day in the laboratory; and the protective measures students and schools staff must take to protect themselves from laboratory chemical exposure.

Waste Disposal Program

The aim of a waste disposal program is to assure minimal harm to humans or the environment from the disposal of waste laboratory chemicals and their by-products left from curriculum experiments. The program is required to specify how waste is to be collected, segregated, stored and transported. Transportation from the school must be in accordance with Department of Transportation regulations or lab-packed with licensed and insured Hazardous Waste Transporters.

During the planning stage of a school experiment, assure that each laboratory operation includes training and waste disposal procedures. Deposit chemical waste in appropriately labeled containers. Do not discharge concentrated acids and bases or highly toxic substances into the sewer or any other substances that might: interfere with the biological activity of the local wastewater treatment plant; create a fire or explosion; or cause structural damage to the school building. Store contaminated waste in closed, suitably labeled, impervious containers. Unlabeled containers of chemicals and solutions should go for prompt laboratory review and disposal and if partially used they should not be reopened.

Most importantly, the school's Chemical Hygiene Officer should be notified after the voluntary termination of a Science Teacher, so they can assure that the chemicals that the teacher was responsible for are inventoried, the storage room cleaned out, and all unwanted chemicals go for proper disposal. No new Science Teacher should accept the onerous of legacy wastes/unwanted chemicals that they did not order, were never responsible for, and are aged and unusable.

It is recommended that waste should be moved to a central storage location at least once per week or designated "Satellite Accumulate" sites should be set up. A Satellite Accumulate site allows for the accumulation of by-products that is generated on daily basis to be stored outside of the formal storage area and labeled with the Hazardous Waste label with the date the first waste is added to the container and after full, the date the container is placed into storage. Once the container is full, it must be placed in storage within 3 days.

Indiscriminate disposal of laboratory chemicals by pouring waste chemicals down the drain or adding them to mixed refuse for landfill burial is unacceptable. Volatilizing chemicals in the fume hood, which is considered media-exchange, should not be used as a means of disposal. Disposal by recycling or chemical decontamination should be used when possible under an approved waste minimization program.

NO MERCURY is allowed in the School District of Clay County schools or classrooms.

APPENDIX B outlines the list of "Prohibited Chemicals" from storage and use at any buildings in the Clay County School District.

Disposal for unwanted or waste chemicals require the:

Establishment of disposal procedures/mechanisms before chemicals are purchased

Formulation of a comprehensive list of chemicals you wish to go for disposal

Science Teacher to ensure laboratory chemicals are disposed of in compliance with the Resource Conservation and Recovery Act (RCRA) state rules designed to minimize damage to human health and to the environment

Reuse/recycle of chemicals whenever possible, before disposing/discarding of unwanted chemicals, contact other schools to determine if your overstocked items can be used at other locations

Expired or obsolete chemicals go for disposal

Disposal of chemicals instructions obtained from the manufacturer or licensed chemical contractor who professionally lab-pack laboratory waste for disposal—contact the ASD if your school is planning to dispose of any laboratory chemicals

SDS(s) with the chemical/s that have been declared a waste

Classification of chemicals as a hazardous or non-hazardous

Laboratory analyses of unlabeled bottles (a special problem), all mystery bottles will under go a battery of costly laboratory tests to determine the disposal method, so it is very important to label each chemical properly

Fume hoods never used to evaporate a hazardous waste or chemical you want to discard

Disregard of the "Flinn Scientific, Inc." catalog referenced disposal treatment methods since they are considered illegal in the state of Florida. The only disposal "treatment" permitted in the District is the neutralization of small quantities of acids and bases; and

When in doubt concerning the disposal of unwanted or waste chemicals, contact the Clay County School District's Chemical Hygiene Officer who will arrange for the disposal.

E. GENERAL PROCEDURES FOR WORKING WITH CHEMICALS

Basic Rules and Procedures for Working with Chemicals

The following OSHA rules and procedures are required by all Clay County School District personnel and students in the event of an accident and spill:

Eye Contact: Promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention

Ingestion: Encourage the victim to drink large amounts of water and seek medical attention

Skin Contact: Promptly flush the affected area with water and remove any contaminated clothing. If symptoms persist after washing, seek medical attention

Spill Clean-up: Promptly clean-up spills, using appropriate protective apparel and equipment and proper disposal

To avoid unnecessary exposure to chemicals involves the development and encouragement of safe laboratory practices:

- Do not smell or taste chemicals
- Vent any discharge of toxic chemicals into fume hood
- Avoid eating, smoking, gum chewing or application of makeup where laboratory chemicals present
- Avoid storage, handling and consumption of food or beverage in chemical storage areas, refrigerators, laboratory glassware and utensils
- Handle and store glassware with care to avoid damage
- Use equipment for designated purpose
- Wash hands copiously after working in the laboratory
- No horseplay in laboratory area that could distract, confuse or startle another lab worker
- Do not mouth suction pipette or start a siphon
- Confine long hair, loose clothing and wear shoes not sandals
- Keep work area clean and uncluttered
- Make sure chemical bottles and equipment is properly labeled and stored
- Clean up the work area at the end of each day
- Assure the appropriate eye protection is worn where chemicals are stored and handled
- Inspect gloves before use, wash them before removal and replace them periodically
- Inspect the respirator before use
- Use appropriate respiratory equipment when necessary
- Use any other protective and emergency equipment as appropriate
- Avoid use of contact lenses in the laboratory unless unavoidable
- Remove laboratory coat and aprons immediately if contaminated
- Seek information about hazards and plan procedures with regards to protection and equipment
- Unattended operations requires signs on the door and provisions for secondary containment
- Be alert to unsafe conditions and see that they are corrected; and
- Do not work alone if procedure being conducted is hazardous.

F. SAFETY RECOMMENDATIONS

According to OSHA the following is a list of major categories of safety hazards found in laboratories: Corrosive agents, electrically powered equipment, fires and explosions, low temperature procedures and pressurized/vacuum operations, which also include the use of compressed gas cylinders. The following general guidelines have been developed by the Clay County School District and are requisites to be followed by laboratory workers and school staff members as outlined below.

Equipment Requirements for All Laboratory Workers:

- Regularly inspect emergency showers, eyewash fountains and fire blankets and retain the records
- Ensure that eyewash fountains and emergency showers will supply at least 15 minutes of water flow
- Keep all equipment in working order
- Do not block exits, aisles, or accesses to emergency equipment or controls
- Do not permit students to use broken or unsafe equipment
- Maintain a file of instruction/operating manuals for all science equipment
- All gas valves in the lab should be turned off at the end of the lab. The master gas valve, if one exists, must be turned off at the end of the day
- Check the stability of shelving that stores chemicals and glassware
- All rough glass edges should be fire polished using prescribed common science practice procedures
- Do not have students insert glass tubing. Teachers should do this procedure. When inserting glass tubing into a rubber stopper, lubricate the tubing with glycerin, wrap the tubing with a towel, and gently twist the tubing into the stopper hole
- Use a grease pencil for labeling glassware
- Place glass-ware contaminated with blood or other body fluids in a "Sharps Container," if available.
- A fume hood should be used for any activity which might result in the release of toxic vapors, mists, fumes, dust or known allergens, flammable gases and noxious odors. Fume hoods must be used when the risk of exceeding a PEL is present or for any chemical whose PEL is 50 ppm or less

Never lean into the fume hood
Place fire extinguishers near an escape route
Compressed gas cylinders must be secured at all times
Large gas cylinders should be chained to the wall
All moving belts and pulleys should have safety guards; and
Report missing/stolen materials or chemicals to the Principal immediately.

Science Teacher's Safe Work Practices:

Unsafe conditions, inoperable or damaged safety equipment or any other potential hazards in the classroom or storeroom should be reported in writing to the school administrator.
Never perform a first-time chemical demonstration in front of your class. Explain and perform a first-time demonstration in front of other science teachers and have them evaluate the need for specific safety precautions to implement before conducting the experiment in front of students
Use science classrooms for science classes only
Lab entrances should always be locked when not in use
Involve students in the pre-lab phase to plan actions in case of an accident
Warn students of all anticipated hazards. In the materials section hand-out indicate the type of hazards anticipated by using the following letter scheme: B = Thermal Burn C = Corrosive F = Fire I = Irritant T = Toxic
Provide verbal and written safety instructions to students
Document students' understanding of proper safety practices prior to each lab activity
Document in your lesson plans safety measures you take as a part of your teaching
Never work alone in a science laboratory or storage area
Never allow students to be left unsupervised
Report accidents to an administrator, or Principal; document the incident in writing
Accidents should be analyzed to prevent repeat incidents
Never overlook any infraction of a safety procedure
Establish clear safety rules based on safety standards and anticipated events
Consider individual student differences in maintaining safety
Be aware of current safety research and regulations
Use proper procedure when an accident or injury occurs (see Appendix D)
Do not permit horseplay in the lab--Maintain Control!
Group sizes should conform to a number which can perform the experiment safely
Plan enough time for the experiment and clean up
Instruct students never to eat or drink in the classroom
All students performing scientific experiments must wear the appropriate required PPE
Visitors to the classroom must follow safety rules
Hand protection should be worn when picking up broken glass. Small pieces should be swept up with a brush and dust pan
Allow falling objects to fall; never try to grab a falling object
Allow glassware to cool after heating by placing it on a special heat-transfer surface.
Do not submerge hot glassware in water
Always pour acid into water--never water into acid
Never pipette with your mouth, use a pipette bulb or automatic filler
Before using an open flame remove all flammable substances from the immediate area. Do not use an open flame to heat a flammable liquid or pressurized distillation. Restrict use of an open flame and extinguish it as soon as it is no longer needed
Develop a written plan of action for emergencies to secure the lab. In a fire drill event, make sure equipment, including heat sources, are turned off
Include a list of safety rules with a substitute's lesson plan, however, it is advisable that a substitute not conduct a lab activity
Document safety violations and report safety concerns in writing to H&S
Post emergency telephone numbers in a conspicuous location in the science room
Do not permit students to take science materials home
Teach and practice safety precautions when working with electrical current
Be aware of students' medical predispositions that could be compromised in lab situations (e.g., epilepsy, allergic reactions, pregnancy, etcetera); and

Collaborate with other science colleagues when reviewing and updating lab activities to current safety standards.
Always inform co-workers of plans to carry out hazardous work
Establish a specific safety plan for each building.

A key feature in creating a safe laboratory environment is a school science curriculum that has well-planned laboratory experiences. To create a safe laboratory environment requires: planning, instruction, and a certain amount of troubleshooting. Planning refers to the teacher having done the lab activity previously to familiarize himself/herself with the procedures and how long it will take. It also includes outlining safety procedures for a given activity and documenting these safety considerations in each lesson plan. Planning can refer to the teacher taking steps to insure student knowledge and accountability for safety practices.

Instruction refers to concise and easily understood written and verbal instructions for a lab activity, as well as materials being prepared and measured ahead of time. It includes equipment being procured and checks to assure all equipment operational and safe. Troubleshooting refers to identifying all the possible hazards of an activity and taking steps to minimize the dangers. If the potential hazards outweigh the educational value, the activity should be omitted.

Lesson Plans

In the classroom, Science Teacher's are required to incorporate health and safety as an integral part of their instruction. Ultimately, it is the teacher's responsibility to make certain that proper safety considerations have been made and that the appropriate precautions have been taken. These safety features should be reflected in the documented Lesson Plans. Appendix D demonstrates the Hazards/Hazard Assessment for Students which outlines risk types and prevention policies.

Teachers should ask themselves the following questions before conducting every laboratory experiment:

What are the risks associated with this activity?

What are its worst possible outcomes?

What do I need to do to be prepared if these outcomes should occur?

What practices, equipment and facilities would reduce risks?

How can I relate these hazards to dangers that my students face in their everyday lives?

G. LABELS & SAFETY DATA SHEET

A The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products. The SDS includes information such as the properties of each chemical; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting the chemical. Sections 1 through 8 contain general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures (e.g., firefighting). This information should be helpful to those that need to get the information quickly. Sections 9 through 11 and 16 contain other technical and scientific information, such as physical and chemical properties, stability and reactivity information, toxicological information, exposure control information, and other information including the date of preparation or last revision. The SDS must also state that no applicable information was found when the preparer does not find relevant information for any required element.

OSHA has updated the requirements for labeling. As of June 1, 2015, all labels will be required to have pictograms (see Appendix H), a signal word, hazard and precautionary statements, the product identifier, and supplier identification. A sample revised HCS label, identifying the required label elements, is provided in Appendix H. Supplemental information can also be provided on the label as needed.

With respect to labels and Safety Data Sheets, the Chemical Hygiene Officer or lead Science Teacher is responsible to:

Require labels on all containers of hazardous chemicals

Maintain SDS's received with incoming shipments of hazardous chemicals; and

Ensure all SDS's are readily accessible to laboratory workers.

It is the *responsibility of the Science Teacher* to know what substances are used in every school experiment, to review the SDS for each substance, and to provide the SDS to their students for review before students work with those chemicals.

It is the *responsibility of the students* to read and understand the SDSs for every chemical before using them during a lab activity.

All Safety Data Sheets must be available in each chemistry laboratory classroom. The Head Custodian should also maintain a copy of all SDSs for all chemicals used or maintained in the school to include cleaning solutions found in custodial closets. The maintained list(s) should be readily available for distribution to responding emergency personnel. The SDSs can be sorted by lab exercises, so all of the SDSs for materials used in that particular lab can be grouped together.

**APPENDIX A
Laboratory Safety Contract**

PREPARE FOR LABORATORY WORK:

- Study laboratory procedures prior to class
- Never perform unauthorized experiments
- Keep your lab bench organized and free of apparel, books and other clutter
- Know how to use the emergency shower, eye wash, fire blanket, and first aid kit

DRESS APPROPRIATELY FOR LABORATORY WORK:

- Always tie back long hair
- No loose or baggy clothing
- Roll up loose sleeves as they tend to get in the way
- No open-toed shoes or sandals
- Wear lab coats during all laboratory sessions
- Wear safety goggles during all laboratory sessions except for pre-lab discuss
- Wear gloves when using chemicals that irritate or can be absorbed through the skin

AVOID CONTACT WITH CHEMICALS:

- Never taste or "sniff" chemicals
- Never draw materials in a pipette with your mouth
- Point the opening away from people, when heating substances in a test tube
- Never carry dangerous chemicals or hot equipment near other people

AVOID HAZARDS:

- Keep combustibles away from open flames
- Use caution when handling hot glassware.
- When diluting acid, always add acid slowly to water (A&W)--never water to acid.
- Only teachers should insert glass tubing through stoppers
- Turn off burners when not in use
- Do not bend or cut glass unless appropriately instructed by teacher
- Keep caps on reagent bottles and never switch caps with other containers

CLEAN UP:

- Consult with the teacher for proper disposal of chemicals
- Wash hands thoroughly following experiments
- Leave laboratory bench clean and neat

IN CASE OF AN ACCIDENT:

- Report all accidents and spills to the teacher immediately
- Place broken glass in designated containers using gloves to clean up glass shards
- Wash all acids and bases or other chemicals from your skin immediately with copious amounts of water
- If chemicals get in your eyes, wash them for at least 15 minutes with laboratory eye wash

I, _____, agree to: (a) Follow the teachers instructions, (b) protect my eyes, face, hands and body during laboratory, (c) conduct myself in a responsible manner at all times in the laboratory, and (d) abide by all of the safety regulations specified above.

Signature _____ Date _____
Parent's (Guardian's) Signature _____ Date _____

APPENDIX B

Prohibited Chemicals

A - Extremely Hazardous	1 -Very Common (76-100%)
B - Hazardous	2 -Common (51-75%)
C - Somewhat Hazardous	3 - Infrequent (26-50%)
D - Relatively Non-Hazardous	4 - Very Infrequent (0-25%)

Aniline	A4	Urethane	B4
Aniline hydrochloride	B4	Benzene/Benzoin	A4
Antimony trichloride	B4	Bromine	A3
Arsenic	A4	Cadmium chloride	A4/Sol. C4
Arsenic trioxide	A4	Cadmium metal	B4
Asbestos	A4	Cadmium sulfate	A4
Benzene	A4	Chromic acid/chromium trioxide	A4
Benzoyl peroxide	A4	Cyclohexane	B4
Chlorine	A3	Formaldehyde	A4
Chloretone	A4	Formalin	B4
Chloroform	A4	Hematoxylin	B4
Chromium	B4	Hydrogen sulfide	B4
Chromium oxide	B4	Hydroquinone	B4
Chromium potassium sulfate	B4	Iso-amyl (or pentyl) alcohol	B4
Chromium trioxide	A4	Mercuric iodide Red Powder	A4/Sol. B4
Colchicine	A3	Mercuric nitrate Cryst.	A4/.02M A4/.1M B4
Dichloroethane/Ethylene dichloride	A3	Mercuric oxide	A4
p-Dioxane	A4	Mercuric sulfate	A4
Hydrobromic acid	A4	Mercurous chloride	A4
Hydrofluoric acid	A4	Mercurous nitrate	A3
Hydrogen	A3	Methyl ethyl ketone	B4
Lithium metal	A4	Pentane	B4
Mercury	A4//H4,FO,R1,C3	1-Phenyl-2-thiourea	B4
Mercuric chloride	A4/Sol. B4	Phenylthiocarbamide	B4
Nicotine	B4	Potassium periodate	B4
Phenol	A4	Sodium chlorate	B4
Phosphorus, red, white	A4	Trichloroethylene	B4
Phosphorus pentoxide	A4	Urethane	B4
Picric acid	A4	Xylene	B4
Potassium metal	A4		
Pyridine	B4		
Pyrogallol acid/pyrogallol	B4		
Sodium arsenate	A4		
Sodium arsenite	A4		
Sodium azide	A4		
Sodium cyanide	A4		
Sodium dichromate	B4/Sol. C4		
Sodium metal	A3		
Sodium nitrite	B4/Sol. C4		
Stannic chloride	B4		
Stearic acid	D4		
Sudan IV	B4		
Thiourea	B4		
O-Toluidine	B3-B4		
Uranyl nitrate	B4		

APPENDIX C SPILL KIT

IF A MEDICAL EMERGENCY EXISTS, REFER TO APPENDIX D

Maintain one spill kit for each chemical laboratory

Attach the following list and procedures to the lid of the 5-gallon spill kit bucket

CONTENTS – “ORDER & IMMEDIATELY REPLACE AS USED”

- *Five (5) gallon plastic bucket with lid*
- *Absorbents such as sand and vermiculite*
- *Mix sand with neutralizing agents such as Sodium Carbonate or Bicarbonate*
- *Plastic bags of different sizes (4 each)*
- *Universal absorbent pads, 16 x 20 (4 each)*
- *Rubber gloves (2 pair)*
- *Splash goggles (1 each)*
- *Lab apron (1 each)*
- *Paper towels*
- *Broom and dust pan*
- *Sponges*

The instructions on the SDS for spill cleanup should be followed.

GENERAL PROCEDURES FOR USING SPILL KIT:

1. *Mix 256 ounces of absorbent sand with 26 ounces of sodium carbonate (10:1) in 5 gallon bucket*
2. *Use Personal Protective Equipment (PPE), minimally use gloves, goggles and apron.*
3. *Ask for assistance--The Plant Manager/Head Custodian is available for urgent response*
4. *Double bag all hazardous waste and label the bag with the chemical name(s) of the waste.*
5. *For disposal, please call Plant Manager/Head Custodian and the Health & Safety Office.*

ROOM NUMBER FOR THIS SPILL KIT: _____

THE PERSON MAINTAINING THIS KIT IS: _____

APPENDIX D LABORATORY HAZARDS & EMERGENCY ACTIONS

IN ALL CASES of injury, hazardous spill, material damage, etc.:

1. FOLLOW EMERGENCY PROCEDURES FOUND BELOW
2. AS NEEDED, NOTIFY THE FRONT OFFICE AND PRINCIPAL FOR ASSISTANCE
3. BE PREPARED TO ACT: ***Know the location and how to use the evacuation routes, eye wash, emergency shower, fire blanket, fire extinguisher, fume hood, exhaust systems, shutoffs, etc.***

EQUIPMENT OR ROOM FIRE

- Evacuate students
- Activate (pull) nearest Fire Alarm Pull Station
- Turn off gas master shutoffs
- Turn off gas master shutoffs
- Call front office or directly call 911
- Close doors and windows
- Close flammable and acid lockers
- Unplug all appliances and equipment

BODY FIRE

- Evacuate, if necessary
- Activate (pull) nearest Fire Alarm Pull Station
- Use a fire blanket (drop & roll)
- Immediately flush with cool water
- Call 911
- Call nurse's office

FAINTING

- Immediately move person to fresh air
- If due to a chemical, evacuate students and activate the emergency exhaust fan
- Keep the head lower than the rest of the body
- Keep warm and/or cover with blanket
- Call nurse's office
- If breathing or heart stops, apply CPR/artificial resuscitation while you send someone to call 911

BODY BURNS

- Follow SDS emergency and first aid procedures
- Send student to the nurse's office with an escort

TOXIC EXPOSURES / POISONING

- Call 911 and/or poison control
- Follow SDS emergency and first aid procedures
- Call front office/nurse
- Identify substance
- Give SDS to emergency personnel

CHEMICAL SPILLS ON BODY

- Follow SDS emergency/first aid procedures
- Call 911
- Identify substance
- Remove clothing or contacts as needed
- Call front office/nurse
- Give MSDS to emergency personnel

MINOR CUTS

- Follow MSDS emergency and first aid procedures
- Follow universal precautions
- Allow to bleed briefly
- Wash with soap and water
- Apply antiseptic and sterile bandage

FLOOR OR COUNTER SPILL

- Follow SDS emergency and first aid procedures
- Activate emergency exhaust fan
- Evacuate if PEL exceeded or chemical an irritant
- Clear students from the spill area if necessary
- Follow **SPILL KIT (Appendix C)** procedures
- Contact Maintenance/Head Custodian for disposal

EYE INJURY

- Follow SDS emergency and first aid
- Flush eye with water for at least 15 minutes using emergency eye wash
- Remove contacts, if necessary
- Do not rub eye
- Call front office/nurse

AFTER THE EMERGENCY

- Cleanup and prepare for the next emergency
- File a Student Accident/Incident Report or a worker's comp Report of Injury
- Get statement from witnesses
- Repeat safety training

APPENDIX E

Checklist for Safety Inspection Items Science Labs, Classrooms, and Lab Preparation Areas		
Item	Condition	Notes
Fire extinguishers		
Fire blanket		
Eyewash working and unblocked		
Shower working and unblocked		
Goggles(splash-proof) in good order and enough for class usage		
Goggle cabinet bulb working		
Fume hoods in working order		
Chemical and materials stored in the proper locations-not in fume hoods or classroom		
Purge fans in working order		
Chemical storage organized and safe lights working, doors locked floors free of materials, chemicals stored properly.		
Lip on shelves in storage room		
Hi/low ventilation working properly in the storage room		
Safety contracts on file for each teacher conducting labs signed by parent and students.		
Electrical hazards not present-extension cords, overloaded plugs		
GFCI outlets near water		
Gas and water shut-off areas unlocked and accessible by the teacher		
Ceiling tiles are not painted and are in good condition (not missing, cracked or altered)		
Exit hallways are free of obstruction (up to 6 feet of clearance).		
Exits and paths to the exits are clear of any obstructions.		
Vision panel on doors uncovered.		
Lights working (no burned out bulbs).		
Outlets covered with a face plate.		
Light switch covered with a face plate.		
Spill kit		
Emergency Procedures poster mounted		
Chemical spill procedures can be located		

APPENDIX F

Industrial color-coding and storage:

Allows for the separation of chemicals into compatible hazard types. See Below:

Green – Low Hazard
Red – Flammable
Yellow – Oxidizer
White – Corrosive
Blue - Poison

**AREA 1
MINIMUM TO
MODERATE
HAZARDS**

Storage Code Green:
suitable for general
storage areas.



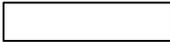
**AREA 2
FLAMMABILITY
HAZARD**

Storage Code Red
Store in flammables
area, separating water
compatible and water
incompatible groups.



**AREA 3
CONTACT
HAZARD**

Storage Code White:
store in corrosion-
proof area separating
acids and strong bases.
Nitric acid should be
isolated.



**AREA 4
REACTIVITY HAZARD**

Storage Code Yellow:
Oxidizers must be stored
away from flammables and
combustibles.



**AREA 5
HEALTH HAZARD**

Storage Code Blue:
Store in secure poisons
area



APPENDIX G

Hazard Communication Standard Pictogram

As of June 1, 2015, the Hazard Communication Standard (HCS) will require pictograms on labels to alert users of the chemical hazards to which they may be exposed. Each pictogram consists of a symbol on a white background framed within a red border and represents a distinct hazard(s). The pictogram on the label is determined by the chemical hazard classification.

HCS Pictograms and Hazards

<p>Health Hazard</p>  <ul style="list-style-type: none"> ■ Carcinogen ■ Mutagenicity ■ Reproductive Toxicity ■ Respiratory Sensitizer ■ Target Organ Toxicity ■ Aspiration Toxicity 	<p>Flame</p>  <ul style="list-style-type: none"> ■ Flammables ■ Pyrophorics ■ Self-Heating ■ Emits Flammable Gas ■ Self-Reactives ■ Organic Peroxides 	<p>Exclamation Mark</p>  <ul style="list-style-type: none"> ■ Irritant (skin and eye) ■ Skin Sensitizer ■ Acute Toxicity ■ Narcotic Effects ■ Respiratory Tract Irritant ■ Hazardous to Ozone Layer (Non-Mandatory)
<p>Gas Cylinder</p>  <ul style="list-style-type: none"> ■ Gases Under Pressure 	<p>Corrosion</p>  <ul style="list-style-type: none"> ■ Skin Corrosion/ Burns ■ Eye Damage ■ Corrosive to Metals 	<p>Exploding Bomb</p>  <ul style="list-style-type: none"> ■ Explosives ■ Self-Reactives ■ Organic Peroxides
<p>Flame Over Circle</p>  <ul style="list-style-type: none"> ■ Oxidizers 	<p>Environment (Non-Mandatory)</p>  <ul style="list-style-type: none"> ■ Aquatic Toxicity 	<p>Skull and Crossbones</p>  <ul style="list-style-type: none"> ■ Acute Toxicity (fatal or toxic)

APPENDIX H

The Basic Parts of A GHS-Compliant Label

1 → **n-Propyl Alcohol**
UN No. 1274
CAS No. 71-23-8

2 → **DANGER**

3 → Highly flammable liquid and vapor. Causes serious eye damage.
May cause drowsiness and dizziness.

4 → Keep away from heat/sparks/open flames/hot surfaces. No smoking. Avoid breathing fumes/mist/vapours/spray. Wear protective gloves/protective clothing/eye protection/face protection. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present. Continue rinsing.

Fill Weight: 18.65 lbs. Lot Number: B56754434
Gross Weight: 20 lbs. Fill Date: 6/21/2013
Expiration Date: 6/21/2020

5 → Acme Chemical Company • 711 Roadrunner St. • Chicago, IL 60601 USA • www.acmechem.com • 123-444-5567

See SDS for further information.



6 →

1. **Product Identifier** - Should match the product identifier on the Safety Data Sheet.
2. **Signal Word** - Either use "Danger" (severe) or "Warning" (less severe)
3. **Hazard Statements** - A phrase assigned to a hazard class that describes the nature of the product's hazards
4. **Precautionary Statements** - Describes recommended measures to minimize or prevent adverse effects resulting from exposure.
5. **Supplier Identification** - The name, address and telephone number of the manufacturer or supplier.
6. **Pictograms** - Graphical symbols intended to convey specific hazard information visually.

Sample label courtesy of Weber Packaging Solutions • www.weberpackaging.com

APPENDIX I

Chemical Disposal Form

School: _____

Contact Person: _____

Phone: _____

Chemical To Be Removed

Name	Quantity	Notes

Department Head
Date: _____

Principal
Date: _____

APPENDIX J

IV-2

SOP Type: Accident - Hazardous Materials

Cross Reference: Chemical Spills, Hazardous Materials

Situation:

Notification has been received that a hazardous materials accident/spill has occurred on or near YOUR SCHOOL'S NAME School campus.

Notification:

- A. Sheriff's Office
- B. YOUR SCHOOL'S NAME School Faculty/Staff
- C. Students
- D. Civilian (person or telephone)

Action:

1. YOUR SCHOOL'S NAME School Staff receiving notification will immediately inform the Senior Administrator.
2. If notification by A or B above, the Senior Administrator will immediately implement the "Lockdown Stage 2" SOP and send an Administrative team to investigate.
3. Upon confirmation, a damage/threat assessment will be determined, including wind direction/speed in case of vapor hazard.
4. If warranted, Emergency Services will be called via 911.
5. If warranted, "Evacuation SOP" will be implemented.
6. If warranted, traffic (pedestrian and vehicular) will be restricted from the affected area.
7. If warranted, the District Safety Office will be notified and Maintenance Repair crews requested.

Post Situation Action:

- A. If the Lockdown Stage 2 SOP" was implemented; it should be canceled once the damage/threat assessment permits.
- B. If the "Evacuation SOP" was implemented, it must remain in effect until Emergency Services personnel give an "All clear".
- C. The affected area must remain a restricted area until District/School Maintenance personnel confirm discontinuance of the restrictions.
- D. The Senior Administrator will, at the earliest convenience, complete an Emergency Procedures incident report, if Lockdown Stage 2 SOP is enacted.

APPENDIX K

IV-IO SOP Type: Chemical Spills

Cross Reference: Accident, Hazardous Materials

Situation:

Notification has been received a hazardous materials accident/spill has occurred on or near YOUR SCHOOL'S NAME School campus.

Notification:

- A. Sheriff's Office
- B. YOUR SCHOOL'S NAME School Faculty/Staff
- C. Students
- D. Civilian (person or telephone)

Action:

1. YOUR SCHOOL'S NAME School Staff receiving notification will immediately inform the Senior Administrator.
2. If notification by A or B above, the Senior Administrator will immediately implement the "Lockdown Stage 2 S.O.P." and send an Administrative team to investigate.
3. Upon confirmation, a damage/threat assessment will be determined, including wind direction/speed in case of vapor hazard.
4. If warranted, Emergency Services will be called via 911.
5. If warranted, "Evacuation SOP" will be implemented.
6. If warranted, traffic (pedestrian and vehicular) will be restricted from the affected area.
7. If warranted, the District Safety Office will be notified and Maintenance Repair crews requested.

Post Situation Action:

- A. If the Lockdown Stage 2 SOP" was implemented, it should be canceled once the damage/threat assessment permits.
- B. If the "Evacuation SOP" was implemented, it must remain in effect until Emergency Services personnel give an "All clear".
- C. The affected area must remain a restricted area until District/School Maintenance personnel confirm discontinuance of the restrictions.
- D. The Senior Administrator will, at the earliest convenience, complete an Emergency Procedures incident report.

APPENDIX L

IV-38

SOP Type: Lockdown Stage 2

Cross Reference: None

Situation:

A campus situation has occurred requiring the Senior Administrator to implement "Lockdown Stage 2" SOP

Notification:

- A. Only the Senior Administrator is empowered to implement school wide "Lockdown Stage 2" SOP
- B. Teachers may implement "Lockdown Stage 2" procedures for their classroom anytime that they hear extremely violent behavior outside their classroom.

Action:

1. The Senior Administrator decides to implement "Lockdown Stage 2" SOP. based on criteria identified in other parts of this Emergency Procedures Manual.
2. To implement this SOP, the following announcement is made over the intercom:
"Attention Teachers! We have a code "Lockdown Stage 2" situation. Please implement "Lockdown Stage 2" procedure at this time."
3. Teachers will accomplish the following as "Lockdown Stage 2" procedures:
 - (a) Students must not be allowed to exit the classroom while this S.O.P. is in effect.
 - (b) Students in hallways must be compelled by teacher to enter into the nearest classroom as soon as the S.O.P. is implemented
 - (c) Normal classroom activities may continue within the room but be attentive to further instructions over the intercom.
4. Be prepared to implement "Duck and Cover" or "Lockdown" SOP's

Post Situation Action:

- A. The Senior Administrator will cancel this SOP as soon as conditions permit.
- B. The Senior Administrator will complete an Emergency Procedures incident as soon as possible if "Lockdown " SOP or " Duck and Cover" SOP is implemented.

APPENDIX M
IV-15
SOP Type: Evacuation

Cross Reference: None

Situation:

A campus situation exists which requires partial or complete evacuation of the YOUR SCHOOL'S NAME School facility, including restricted evacuation routes.

Notification:

- A. Only the Senior Administrator is empowered to implement school-wide evacuation SOP
- B. An individual teacher convinced of a clear and present imminent danger through first hand observation may invoke Evacuation procedures for that class only after notifying Main Office.

Action:

1. The Senior Administrator decides to implement "Evacuation" SOP based on criteria identified in other parts of this Emergency Procedures Manual.
2. To implement this SOP on a school-wide basis, the following announcement will be made over the intercom:

***"Attention Teachers! We have a Code Evacuation situation.
Please implement evacuation procedures immediately.***

Do not, I repeat, do not evacuate towards the:
(specify as applicable)

 - 1. *Main Parking Lot*
 - 2. *Bus Circle*
 - 3. *Gym*
 - 4. *Science Building*
3. Evacuate students quickly and quietly and take a class roll/list of students with you, locking the door behind you. Self-Contained ESE Units will follow department developed procedures.
4. Evacuate students according to normal "Fire Drill" evacuation map routes unless your primary route is unavailable (per intercom announcement) in which case you must use the secondary route identified on the posted classroom evacuation map.
5. Personnel not in an area with a designated evacuation map must evacuate by the nearest exit and go to the nearest staging area (main parking lot, bus loop, or athletic field).
6. Self-contained ESE students out of classrooms with Teacher Aides will join the nearest class and remain until our evacuation to football stadium occurs.
7. Under No Circumstances should you evacuate towards the "no evacuation area" announced on the intercom!
8. Extended Evacuations:
If the Senior Administrator decides the evacuation will require an extended period of time, he will advise by radio to relocate all staff and students to the athletic field according to the following plan:
 - (a) The parking lot area will use the route on the road behind the gym to the football field by the vehicle gates at the Agricultural Barn.
 - (b) The bus loop area will use the driveway behind the Science Building and go through the athletic parking lot to the personnel gate in left field area of the baseball field and then on to the football field.

- (c) The building four, five and six staging behind the Band/Chorus Building area will report to the football field through the athletic ticket gate. Teachers must sit with and monitor their students according to the seating assignments.

Post-Situation Action:

- A. The Senior Administrator shall cancel the "Evacuation" SOP as soon as conditions permit.
- B. If cancellation of the "Evacuation" S.O.P. will be delayed to the point it is in the students' best interest to dismiss school for the day, ~the Senior Administrator will notify the District Safety Office for transportation arrangements, including Self-Contained ESE Unit needs.
- C. The Senior Administrator will complete an Emergency Procedures Incident Report as soon as possible.