ENVIRONMENTAL HEALTH AND SAFETY PROGRAM

CHEMICAL HYGIENE PLAN

Medford Area Public School District

Ted Wilson	**Chemical Hygiene Officer Room# 203**
Classes and rooms covered by this Plan: All district buildings/rooms.	

Medford Area Public School District	
Contacts:	
Patrick Sullivan	District Administrator
Dave Makovsky	Building and Grounds Supervisor
	Chemical Hygiene Officer, Chemistry Teacher

Luke Krumenauer	CESA 10 Environmental Health and Safety Consultant
Program Last Updated	August 21, 2013

Part I - CHEMICAL HYGIENE OFFICER DUTIES AND RESPONSIBILITIES

1. The **Chemical Hygiene Officer (CHO): Ted Wilson, Chemistry/Physics Teacher Rm. 203**
   The CHO shall:
   - have sufficient training and experience to evaluate, implement, and update Plan.
   - be provided with sufficient time and authority to conduct required tasks.
   - relay information to the **(SPS 332.11(2) "Safety Contact Person") – Dave Makovsky** and other administrators as needed.
   - implement and/or enforce implementation of the Chemical Hygiene Plan.
   - have sufficient training and education on hazardous chemicals, storage, and laboratory procedures

2. The **Chemical Hygiene Officer and the classroom teacher** are responsible for chemical hygiene in the:
   - Chemistry Classrooms
   - Chemical Storage Rooms
   - Biology Classroom
   - Art room
   - Agricultural Room
   - Family and Consumer Ed
   - Woodworking lab

3. The **Chemical Hygiene Officer** has the responsibility for chemical hygiene in the lab including the responsibility to:

   - Ensure that affected personnel know and follow all safety rules, use appropriate personal protective equipment, and provide students with appropriate safety training.

   - Develop and implement a schedule for regular formal housekeeping inspections including inspections of emergency equipment. Document the schedule in Appendix E.

   - Know the current legal requirements concerning regulated substances, both in SPS 332 and adopted OSHA standards.

   - Ensure that the facilities are adequate for any material being used.

   - Plan and conduct each lesson in accordance with the Chemical Hygiene Plan. Lesson plans shall include safe work practices developed using the Chemical Hazards Preparation Form, Appendix A.

   - Select gloves that are resistant to the chemicals and include them in the laboratory chemical inventory, Appendix F. Information on glove selection can be found in Appendix G.

   - Obtain Material Safety Data Sheets, MSDS, for new chemicals, maintain MSDS for current chemicals on www.msdsonline.com which will ensure they are updated and www.msdsonline.com is readily accessible to any employee, including custodians, through any computer assigned to the individual.

   - Date and remove paper copy MSDS for chemicals no longer present in the areas under the Chemical Hygiene Plan. Archive these MSDS for 30 years. Electronic copy MSDS for chemicals no longer present in the areas under the Chemical Hygiene Plan will be archived on www.msdsonline.com for 30 years.

- Develop and follow Good Lab Practices (GLP's) and personal chemical hygiene habits.

- Annually review the Chemical Hygiene Plan and document any significant changes. See Appendix C.

4. The Chemical Hygiene Plan will be available for review upon request to all employees. Copies of the plan will be both located in digital format and hard copy in the following areas:
Locations:

   1. **District Office Environmental Management Binder, Jennifer Kuenne**
   2. **High School, Room 203 – Ted Wilson, CHO**
   3. **District Website: www.medford.k12.wi.us**

5. Inventory of Chemicals, Appendix F:
   - The Medford Area Public School District must keep a complete and ongoing inventory of all chemicals at the worksite.

   - The inventory will be maintained by Jennifer Kuenne, Administrative Assistant & MSDS Online Administrator. The Medford Area Public School District Laboratory Chemical Inventory can be found in Appendix F. The Medford Area Public School District's complete chemical inventory can be found in Appendix I, as well as in Medford's e-Binder at:

     https://msdsmanagement.msdsonline.com/?ID=D4F45D74-43A3-4AA7-8712-18EFA8F2045D

   - The inventory must be updated at least annually to cross check against the previous inventory,

     - sort unused, expired, discolored or decomposed chemicals for appropriate disposal
     - check the condition of caps, bottles for cracks or breaks in seals.
     - check labels for legibility.

   - This inventory must be available for all lab staff, or compliance officer review. The standard format for the chemical inventory shall include but not limited to; the chemical name, compatible storage location, date of purchase.

Part II - GENERAL GUIDELINES FOR WORKING WITH LABORATORY CHEMICALS

1. It is essential to minimize chemical exposure to the greatest extent possible. Because few laboratory chemicals are without hazards, precautions for handling all chemicals shall be exercised. As a rule, skin contact with chemicals shall always be avoided.

2. Avoid an underestimation of risk. Exposure to laboratory chemicals shall be minimized even for substances of no known significant hazard. Special precautions shall be taken for substances with special health hazard risks. One shall assume that any mixture of substances would be more toxic than either of its single components alone. One shall also assume that all substances of unknown toxicity are toxic.

3. Adequate ventilation must be provided. The best way to prevent exposure to hazardous substances is to prevent their escape into the atmosphere by use of fume hoods and other ventilation controls. Containers of volatile chemicals shall be capped before and after contents are accessed.

4. Chemical storage areas shall be annually inspected for outdated chemical stock and deteriorated, leaking, or broken containers. Such containers shall be brought to the attention of the CHO and disposed of properly.

All chemical substances that have the potential to become unstable with age shall be disposed at the end of each school year, regardless of the quantity of each substance in inventory.

5. HAZARD PREVENTION

a) In-house safety and health inspections with an emphasis identifying safety hazards will be performed as scheduled in Appendix E.

b) Fire or emergency drills shall be conducted routinely and the results reviewed.

c) Utilize information in the Specific Safe Work Practices by Hazard section of this Plan, and 1910.1200, to complete the Chemical Hazards Preparation Form prior to chemical use and conducting class lesson.

d) Where the Chemical Hazards Preparation Form has been completed for a recurring lesson it shall be reviewed prior to the lesson.

e) Each procedure with hazardous chemicals shall include actions preplanned in case of an emergency (e.g., equipment to be turned off.) The actions shall be documented at the bottom of the Chemical Hazards Preparation Form, Appendix A.

f) Up-to-date emergency phone numbers, escape routes, www.msdsonline.com Nurse and fax-back assistance phone number, designated meeting location(s) outside the building and designated person to authorize the re-entry into the building, are posted next to the door.

g) Diluted substances shall be used wherever possible instead of concentrates.

h) All work utilizing hazardous chemicals shall be of appropriate scale that corresponds to the physical facilities available. Use smaller quantities of hazardous materials for laboratory demonstrations.

i) Apparatus that may discharge toxic chemicals (e.g. vacuum pumps, distillation columns, etc.) shall be vented into local exhaust devices such as hoods.

j) Laboratory operations involving hazardous chemicals that are carried out continuously or overnight shall be designed to prevent the release of hazardous substances in the event of an accident or interruptions in utility services. Classroom lights shall be left on and appropriate signs posted identifying the hazards of the chemicals and phone number of the instructor responsible for the operation.

k) Use films, videotapes, or other methods rather than experiments involving extremely hazardous substances.

l) Analyze accidents to prevent repeat incidents.

m) Do not use damaged glassware.

6. FACILITY MAINTENANCE

a) Fire Extinguishers shall be placed near easily accessible areas, escape routes and in areas of high hazards.

i. The Safety Contact Person, Dave Makovsky, performs monthly visual inspections of fire extinguishers.
ii. The Safety Contact Person, Dave Makovsky, shall ensure that annual maintenance checks are conducted and records of annual inspections are maintain for one year after the last entry or life of the shell, whichever is less.
iii. Hydrostatic testing as required by 1910.157(f) shall be performed and designated personnel trained in the proper use of extinguishers.
iv. Employees expected to use extinguisher to put out incipient stage fires shall receive training as required by 1910.157(g) initially and annually.
v. 1910.157 can be viewed on osha.gov, click on the regulations tab at the top of the page.

Fire Extinguishers that are compatible with chemical hazards in the lab:

Fire Extinguisher	For use with	Incompatible with
Class A, B, and C	Ordinary Combustibles, Flammable Liquids and Gases, and Electrical Fires	Combustible Metals
Class D	Combustible Metals	Ordinary Combustibles, Flammable Liquids and Gases, and Electrical Fires

b) Never block escape routes.
c) Never block a fire door opening.
d) Never store materials in aisle ways or on edges of counters.
e) Regularly inspect safety showers and eyewash stations as scheduled in Appendix E to make sure they continue to be in working order and up to code.
f) Maintain records, whether it be monthly, quarterly, biannually or annually indicating inspections and/or changes to facility maintenance issues as stated by the CHP, Appendix E.

7. GENERAL LABORATORY SAFETY

Each student and instructor will initial and date a checklist, Appendix D, indicating their understanding of items a-v at the start of the school year or at the beginning of Semester for semester courses.

a) Review and understand the Chemical Hazards Preparation Form prior to beginning the lesson.

b) Do not smell or taste chemicals. Do not use chemical glassware as a container for food or drinks.

c) Never work alone in a science laboratory or storage area and do not allow students to work unsupervised.

d) Never eat, drink, smoke, chew gum, or tobacco in the laboratory environment.

e) Never store food in laboratory refrigerators.

f) Labels on incoming containers shall not be defaced. Labels that have become difficult to read shall be replaced.

g) Hazardous waste containers shall be clearly marked as to type of contents, i.e. solvents, to prevent incompatible chemical mixtures. Containers shall be closed unless in use.

h) Never pipette liquids by mouth.

i) Restrain loose clothing, long hair, and dangling jewelry. Students or teachers with skin exposed above the knee shall wear a lab coat or apron when handling any hazardous chemical.

j) Never leave heat source unattended (gas burners, hot plates, mantels, etc.).

k) Do not mix chemicals in the sink drain or discard down drain unless indicated as safe on Chemical Hazards Preparation form.

l) Always inform co-workers of plans to carry out hazardous work.

m) Avoid horseplay, practical jokes, and any other distracting behavior. Students are not allowed to take chemicals outside of the classroom setting.

n) Clear work area of non required material and plan appropriate protective procedures and positioning of equipment before beginning any new operation. Be alert to unsafe conditions and correct them when detected.

o) Exercise great care in noting odors or fumes. Use a wafting motion of the hand to note a small amount of odor.

p) Use equipment only for its designated purpose. Use the fume hood when working with chemicals or process with potential for emitting harmful vapors.

q) Always add concentrated acid into water. Use care as it may splash out, and it generates a large amount of heat. Use concentrated acids in the fume hood.

r) Wear safety equipment as required on the Chemical Hazards Preparation Form for the lesson.

s) Wash hands before and after work, and after spill cleanups.

t) Report all accidents, injuries, or near misses to instructor or the CHO.

u) Always keep work area clean and keep combustible material away from open flames. Keep chemical containers and glassware well back of the edge of the bench or counter.

v) Know the location and how to use all the safety equipment in the laboratory.

Part III - THE LABORATORY (CLASS ROOM)

1. EQUIPMENT

- The facility provides adequate, well-ventilated classrooms, laboratory fume hoods, and sinks.
- Other safety equipment includes eyewash stations and drenching showers.
- The facility provides PPE required according to appendix A and/or MSDS of the chemical used

2. VENTILATION

- Modifications: Any alterations to the ventilation system shall be made only by qualified personnel (HVAC engineer), and if testing indicates that worker protection from airborne toxic substances will continue to be adequate.
- Fume Hoods
  - ❖ Laboratory fume hoods during use shall be operated with a minimum average 100 feet per minute face velocity at full open sash or sash stop position.
  - ❖ When determining the minimum flow rate through the fume hood, the sash stop position may not be lower than 18 inches above the work surface.
  - ❖ When operating the fume hood, the sash should be positioned to maximize the protection to the user.
  - ❖ Vertical sash fume hoods operated at sash stop positions shall have an alarm that gives a warning when the sash is raised above the sash stop position. Unless the flow rate is 100fpm average at full open sash position.
  - ❖ Combination vertical/horizontal sash fume hoods shall have an alarm that gives a warning when the sash is vertically raised from the fully lowered position.
  - ❖ Testing. Operable fume hoods shall be tested annually for 100fpm minimum average face velocity.

3. CONTROL MEASURES: CRITERIA AND USE

Fume Hood:

- Always use a fume hood when working with
  - volatile substances,
  - toxic vapors are produced
  - concentrated acids
  - chemicals having a potential exothermic reaction,
  - over flow and
  - vapor or fume production.
  - potential for exposures above Limits
  - where recommended by the MSDS

- Never lean into the fume hood while hazardous chemicals are being used or when in use.

- Do not use the fume hood as a storage area or block the hood exhaust airflow.

- Verify that the exhaust system is operating before working in the hood. Taping a strip of paper, tissue, or ribbon at the face of the hood will indicate the direction of air flow;

- Regularly check the ventilation in hoods for proper airflow and that minimum flow alarm is in working order.

Acids and Corrosives Cabinets:

- Bottles of acid shall be stored in an acid (corrosive) cabinet. While acids and bases are both considered to be corrosive, care must be taken to not store acids and bases in the same cabinet. It is particularly important to avoid storing ammonium hydroxide and strong mineral acids in the same cabinet.

- Oxidizing acids, such as nitric acid, shall be stored separately. **[insert methods you use to keep oxidizing acids separate from other acids. Such as: a separate cabinet or inside a polypropylene box inside the acid cabinet insert method used by your school]**

Flammable Storage Cabinets:

- Where incompatible flammable chemicals must be stored in the same cabinet steps will be taken to prevent mixing if containers leak or spill, such as placement in separate dish pans.

- Shall not be used for non-flammable items.

Disposal:

Method of disposal shall be included on Chemical Hazards Preparation Form

- Liquid waste is segregated by compatibility containers are labeled as required in the Waste Disposal section. **Containers are located in the Medford Elementary, Middle and High School shipping and receiving areas.**

- Liquid or soluble waste that can be disposed of down the sink drain shall be discarded while the water is run at sufficient volume to dilute the substance as needed but not to create splashing of the concentrated substance outside of the sink.

- The Chemical Hazard Preparation Form shall designate when sink disposal shall only be conducted by the instructor or when students may utilize the process.

- Flammable or combustible waste material and residues shall be kept to a minimum, stored in closed metal waste cans, and disposed of daily.

Heat:

- Where heat is applied or generated only heat resistant glassware shall be used.
- Sufficient goggles for splashing and heat resistant gloves shall be provided.
- Protective heat resistant pads shall be supplied to prevent direct contact with books or bench tops.
- Tongs or other mechanical means shall be provided to allow manipulation of material or contents without contact.

Part IV - STANDARD OPERATING PROCEDURES

1. PROCUREMENT

- Before a new chemical is purchased:
  - Obtain and read the Material Safety Data Sheet for each hazardous chemical.
  - When possible, a less hazardous chemical shall be substituted.
  - The minimum quantity necessary shall be calculated and as close to that amount as possible shall be purchased.
  - Particularly hazardous chemicals (highly toxic, carcinogens, reproductive toxins, etc) will not be used without permission of the Chemical Hygiene Officer, obtaining and/or implementing specific engineering and work practice controls and PPE as required by 1910.1450(e)(3)(viii).
  - The teacher shall complete the Chemical Hazards Preparation Form in Appendix A prior to each lesson, including safe work practices and emergency procedures, and provide them to the Chemical Hygiene Officer for review and approval.
  - Available PPE shall be evaluated for resistance to the new chemical. If it is not sufficient either it shall not be purchased or

- PPE known to be resistant to the chemical shall be purchased,
- the Certification of Hazard Assessment for PPE shall be updated
- employees using the new chemical shall be trained in the hazards and PPE.

  This shall be completed prior to use of the chemical.

- Each individual teacher will be responsible for ordering the chemicals needed to perform their desired labs;

  - Where sufficient existing quantities of the chemical are available in the school district the chemical shall not be purchased.
  - To avoid duplicate purchasing orders, all laboratory chemical orders shall be approved of by the CHO.
  - The smallest available quantity that will cover their expected use for the school year shall be ordered.

- Donated chemicals or chemicals from other classrooms in the School District shall be accepted only after approval is obtained from the Chemical Hygiene Officer. It should be established that the donated chemical is in excellent condition, that an appropriate MSDS is available, and that there is a specific use for the donated material. Transferred chemicals from school building to school building are required to be transferred in a school district owned vehicle.

- No container will be accepted without a Material Safety Data Sheet and a label clearly identifying at least the contents by name as it's found on the MSDS. No container will be accepted if it's leaking.

- Sealed containers, such as for biological specimens, shall be labeled, have an MSDS, and employees shall be trained in the hazard of the chemicals in the container.

- Food items used in experiments shall be clearly marked as "not for food use" and shall have an MSDS, where possible, for safe storage and use.

- A new chemical provider's MSDS will be compared to the MSDS used in current hazard assessments prior to purchase for chemical mixtures or dilutions.

- The MSDS inventory shall be stored and readily accessible to employees during each work shift at: https://msdsmanagement.msdsonline.com/?ID=D4F45D74-43A3-4AA7-8712-18EFA8F2045D

  - If the internet is not-accessible utilize the ww.msdsonline.com hotline with professional Nurse and fax-back assistance at: 1-888-362-7416

- A separate 3 ring binder for MSDS of chemicals no longer present at the district is located at the district office. The MSDS for these chemicals will be saved for 30 years.

2. STORAGE:

- Toxic substances shall be segregated in a chemical storage cabinet off limits to unauthorized individuals.

- **The Chemical Hygiene Officer** shall examine stored chemicals at least annually for replacement, deterioration and container integrity. Amounts will be stored in the smallest practicable quantity. Yearly inventories will be conducted and unneeded items will be disposed of properly. See Appendix F.

- Chemicals that are discovered or no longer needed in classrooms in Medford Area Public School District shall not be sent to the designated Chemical Storage area until:

  - An MSDS is reviewed.
  - The CHO is notified.
  - The CHO has determined the chemical storage requirements prior to disposal
  - The chemical can be safely stored until disposal.
  - Once disposed of and knowingly no longer present in the district, the MSDS has been archived

- Chemicals will be stored in accordance with accepted standards of compatibility. Incompatibles **shall never be stored together.**

- Appendix F, laboratory chemical inventory list, arranged alphabetically if possible, will be posted in the storage room. Material Safety Data Sheets are available at the above identified internet address and phone number.

- Do not store chemicals, reagents or apparatus on lab bench. Keep shelves organized with labels facing out.

- Should the label become defaced or degraded the reason for this condition shall be identified (student defacement, poor pouring practices, seepage from under lid due to warm storage conditions) and

corrected where ever possible. A new label and/or method of labeling (such as contacting the manufacturer for a replacement label or secondary container label, or creating and printing a label from www.msdsonline.com or by obtaining a label from the manufacturer) shall be implemented.

- Where a lesson requires unlabeled containers they shall be stored in such a way that their contents are identified when not under the direct control of the teacher.

- Chemical storage shelves with closeable doors shall be used for flammable and corrosive materials.

- Sealed containers, such as for biological specimens, shall be labeled, have an MSDS, and employees shall be trained in the hazard of the chemicals in the container. The label can be on the front of the cabinet or on the shelf under the containers providing the containers are always returned to the storage area at end of use.

- Never store materials in aisle ways. Never store chemicals above eye level.

- Stored waste will be labeled as to the type of contents and located at each buildings (elementary, middle and high school) shipping and receiving area. No more than one container of waste per type shall be stored at a time. When container is full the Safety Contact Person, Dave Makovsky, shall be notified within the week for schedule of pick up and disposal.

- "Fire control" –

    - "Extinguishers." Suitable fire control devices, such as small hose or portable fire extinguishers, shall be available at locations where flammable or combustible liquids are stored.
    - At least one portable fire extinguisher having a rating of not less than 12-B units shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage.
    - At least one portable fire extinguisher having a rating of not less than 12-B units must be located not less than 10 feet, nor more than 25 feet, from any Class I or Class II liquid storage area located outside of a storage room but inside a building.
    - "Sprinklers." When sprinklers are provided, they shall be installed in accordance with 1910.159.
    - "Open flames and smoking." Open flames and smoking shall not be permitted in flammable or combustible liquid storage areas.
    - “Water reactive materials." Materials which will react with water shall not be stored in the same room with flammable or combustible liquids.

3. DISTRIBUTION FROM STORAGE AREA:

- When bulk quantities of chemicals are hand carried, the container will be placed in a bottle carrier or bucket.

- When the need for the container has been concluded it shall be returned to the storage area.

4. USE:

- Shall be in compliance with the General Guidelines for Working with Laboratory Chemicals in Part II of this Plan.

- Prior to performing a new procedure the Chemical Hazards Preparation Form, Appendix A, shall be

completed, including safe work practices and emergency procedures, shall be developed and documented utilizing information on the MSDS and in this Plan.

- Availability of engineering controls and PPE identified on the Form.
- Safe work practices, engineering controls, and PPE identified on the Form shall be implemented. Where changes are needed the Form shall be updated and the CHO notified.
- If a chemical is newly deemed particular hazardous chemicals (carcinogens, reproductive toxins, etc), proper provisions will be made in accordance with 1910.1450(e)(3)(viii).

5. AIR MONITORING:

- Where required by an expanded OSHA standard adopted by the State of Wisconsin air monitoring shall be conducted.
- Where there is potential for exposures to exceed Wisconsin exposure limits evaluation of new engineering controls, replacement of the chemical or process shall be considered. The limits can be accessed at http://dsps.wi.gov/sb/docs/SB-IndustHygLimitsAirContamins.pdf in the final rule columns.
- Where exposures still potentially exceed limits, air monitoring shall be conducted.
- Where air monitoring data shows an exposure above a limit the procedure **shall be discontinued** until employee protection is developed and implemented.

6. HOUSEKEEPING:

- Formal housekeeping and inspections will be performed by the CHO on the schedule developed in Appendix E. The purpose of this is to identify new or unforeseen hazards, assess control measures, and to ensure that the safety equipment is used and procedures are followed and maintained.
- Where control measures are found to be insufficient additional measures, such as ventilation, modified work practices or additional personal protective equipment shall be obtained or developed and implemented and the Chemical Hazards Preparation Forms updated as needed.

7. MEDICAL EVALUATION:

All employees who work with hazardous chemicals shall be provided with an opportunity to receive medical attention, including any follow-up examinations which the examining physician determines to be necessary, under the following circumstances:

- Employees who show signs or symptoms associated with exposure to hazardous chemicals will be sent to a licensed physician for medical attention.
- Employees exposed to spills, leaks or explosions of hazardous chemicals will receive opportunity for medical attention.

- Where exposure monitoring reveals an exposure level routinely above the action level (or in the absence of an action level, the PEL) for an OSHA expanded standard for which there are exposure monitoring and medical surveillance requirements, medical surveillance shall be established for the affected employee as prescribed by the particular standard.

All medical examinations and consultations shall be performed by or under the direct supervision of a licensed physician and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place.

Employees who may fall under the above conditions shall first inform the Chemical Hygiene Officer and then go to the school nurse if available. If an evaluation of the work area and employee health and/or exposure shows that the above conditions have been met, the employee will be sent, with MSDS, to the Memorial Health Center for an examination by a physician.

Employees with signs and symptoms requiring immediate treatment or injuries from explosions shall go directly to the Memorial Health Center to receive treatment, and notification to the CHO shall be made by others or when the employee is physically able.

The Chemical Hygiene Officer shall:

I. Provide the following information to the physician:
   a) The identity of the hazardous chemical(s) to which the employee may have been exposed;
   b) A description of the conditions under which the exposure occurred including quantitative exposure data, if available; and
   c) A description of the signs and symptoms of exposure that the employee is experiencing, if any.

II. Obtain from the physician a written opinion from the examining physician including:
   a) Any recommendation for further medical follow-up;
   b) The results of the medical examination and any associated tests;
   c) Any medical condition which may be revealed in the course of the examination which may place the employee at increased risk as a result of exposure to a hazardous workplace; and
   d) A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment.
   e) The written opinion shall not reveal specific findings of diagnoses unrelated to occupational exposure.

III. Establish and maintain for each employee an accurate record of any measurements taken to monitor employee exposures and any medical consultation and examinations including tests or written opinions provided by the Physician. This record shall be located in the elementary school nurses office.

8. PROTECTIVE EQUIPMENT AND APPAREL:

Selection shall be based upon an assessment of the hazards of the chemical (i.e. corrosive) and on the hazards of the process (i.e. splashing.) and shall be noted on the Chemical Hazards Preparation form, Appendix A. PPE selected on the Form shall be available prior to exposure to the chemical or process.

PPE may include but not limited to the following.

- Face shield or Safety glasses/goggles that meet ANSI Z87.1 Standards. Wear chemical safety goggles with face shield when using large quantities, or chemical safety goggles when using small quantities of liquids, safety glasses for solids.

- Hair ties will be required to contain long hair. Floppy clothing shall be restrained, either by wearing a lab coat or by other means.

- Feet shall be adequately covered to protect them from chemical hazards. Sandals or open toed shoes will not be allowed in the lab. Splashes of chemicals to shoes or clothing shall be cleaned off immediately.

- Wear a lab coat and/or rubber, neoprene, or PVC apron when using large quantities and splash potential exists. Lab coats and aprons shall be discarded if damaged sufficiently to reduce protective quality.

Gloves:

- Appendix G contains information for selection of gloves resistant to the chemicals used. Part IV #14 contains information on specific hazards of chemicals. The Inventory, Appendix F, lists the gloves selected, by thickness and material, for each chemical.

- Verification of the thickness and material shall be conducted prior to ordering new gloves, even when using the same brand name. Communicate purchasing problems to the CHO.

- The hazard assessment shall be done in compliance with the OSHA standard on general requirements for personal protective equipment (29 CFR 1910.132). Selection shall be done in compliance with the OSHA standard on hand protection (29 CFR 1910.138). As required by 1910.132(d)(2) the glove selection shall also be included in the Certification of Hazard Assessment for PPE for the Medford Area Public School District.

- Gloves selected for an operation shall be identified in the Chemical Hazards Preparation Form, Appendix A.

    - Where multiple chemicals are used in an experiment and require different gloves further research is required to ensure the gloves will provide adequate protection. Alternately, double gloving, one of each, is an option.
    - Tasks shall be evaluated for potential penetration, physical and chemical, and tearing by the processes in the operation.

- Avoid skin contact with chemicals where burns or absorption of the material is possible. Change gloves after use or after chemical splashes.

- Remove, rinse, or replace contaminated gloves before taking off safety glasses, using a writing tool, answering the phone, etc.

- Never leave the laboratory/science classroom with PPE on, especially contaminated PPE.

- For Common Sense Glove Use Rules go to Appendix G.

9. SIGNS AND LABELS:

- Emergency telephone numbers will be posted by the door and the phone.
- Identifying labels must show contents of containers, including waste containers.
- Signs to distinguish areas where food and beverages are prohibited and warnings at areas where unusual hazards exist will be posted.
- Unknown samples for student lessons shall have a # on each container. The # then has a correlating note card indentifying the hazardous chemical(s) in the container, and the hazards present.
    - Example: Potassium Iodide, Odorless and Possible Sensitizer.
- Doors leading to a room, where chemicals are stored, will have the types of hazards, such as air reactive, associated with the chemicals being stored.
- Label all chemicals accurately with date of receipt or preparation and any other precautionary information for handling.
- Never use a reagent until the label has been read and contents checked.

10. RECORDS

Shall be maintained by the Chemical Hygiene Officer. Paper records will be kept within a filing cabinet in chemical storage room.

- Accident reports will be written and retained for all accidents involving injuries, property damage and near misses by chemical, biological or environmental exposure or improper handling. A final copy of the report should be sent to Jennifer Kuenne at the District Office.
- Failure of engineering controls, PPE, containers, or safe work practices shall be recorded and reviewed for accident prevention purposes by the Chemical Hygiene Officer.
- Data from measurement of employee exposure or employee work areas and any medical consultations and exams that are conducted shall be stored for the duration of employment plus 30 years.

11. INCIDENT CLEAN-UP PROTOCOL

Prompt response to chemical spills is critical to protect student and worker health & safety and to mitigate adverse affects to the environment. Familiarize, update and follow the following protocol.
For small spills, 30 ml of hazardous chemical or less, the teacher shall clean up if the perceived risk is low.

1. Notify CHO and have personnel in the area to restrict access.
2. If volatile materials are involved, the Building and Grounds Director, Dave Makovsky, shall be notified to go to 100% outside air or turn off the HVAC to prevent contamination of recycled air.
3. Eliminate all sources of ignition and turn off equipment if it is possible to do so safely.
4. Review the MSDS for the spilled material, or use your knowledge of the hazards of the material to determine the appropriate level of protection.

5. Wear gloves and protective eyewear. Do not attempt cleanup if you feel unsure of your ability to do so or if you perceive the risk to be greater than normal laboratory operations. Cover spill with sodium carbonate or bicarbonate, or material in the spill kit. When reaction stops pickup with damp sponge or paper towels and put the contaminated absorbent in a labeled hazardous waste container.
6. Spill kits shall be applicable to the hazards and kept stocked by the Chemical Hygiene Officer.

If greater than 30 ml. or if it will take longer than 15 minutes for you to clean-up,

1. Evacuate students, turn off equipment and access the www.msdsonline.com Medford e-Binder when in a safe location.
2. Immediately call **CHO** at **715-748-5951 ext. 435** and the Safety Contact Person at **715-965-5064** to report the spill, and help with proper cleanup and disposal procedures.
3. The CHO and teacher shall restrict access to the area.
4. The CHO shall contact the Department of Natural Resources Wisconsin Chemical Spills hotline at 1-800-943-0003 ext. #1 for direction to a qualified response team responsible for the clean-up and disposal of hazardous chemicals.

Incident Reporting & Follow-up:

1. Report all occupational injuries or illness to CHO as soon as possible. CHO, Safety Contact Person or laboratory personnel must document the incidence and file with CHO.
2. Personnel are encouraged to report "near misses" as they are considered a precursor to actual incidents.
3. ***Science Teacher and CHO*** are to conduct (or coordinate) an investigation of all incidents and "near misses." The goal of the investigation is to identify and address any deficiencies in the Standard Operating Procedures or Chemical Hazard Preparation Form that may have contributed to the incident and correct/update the CHP to address these issues.

12. INFORMATION AND TRAINING:

Employees will be trained upon initial assignment to areas covered by this Plan and when a new chemical hazard is identified. This training shall include chemicals available, procedures, location of the Chemical Hygiene Plan, how to access Material Safety Data Sheets, and the Chemical Hygiene Officer will cover the method of hazard identification with an annual refresher training**. Information and Training shall include the following but not limited to:**

A. ***Components of the Chemical Hygiene Plan***:
- The contents of this standard and its appendices, which shall be made available to employees
- The location and availability and contents of the Chemical Hygiene Plan
- How to properly address accidents or incidents as provided in Appendix B of the CHP.

B. Understanding of Potential Hazards:
- The location and availability of known reference material on the hazards, safe handling, storage and disposal of hazardous chemicals found in the laboratory, including but not limited to, **MSDS** sheets.
- Chemical inventory requirements and proper handling and storage.
- 1910.1000 1992 OSHA occupational exposure limits

C. Recognition of Chemical Exposure:
- The physical and health hazards of chemicals in the work area
- Signs and symptoms associated with exposures to hazardous chemicals used in the laboratory.
- Methods and observations that may be used to detect the presence or release of a hazardous chemical (such as monitoring conducted by continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.)

D. S***afe Work Practices:***
- The measures employees can take to protect themselves from these hazards, including specific procedures the Chemical Hygiene Plan has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.

13. WASTE DISPOSAL PROGRAM

Identified Hazardous Waste will be collected, segregated, stored and disposed of in compliance with all current local, state and federal regulations.

- Use **MSDS** guidelines to determine proper disposal methods.
- All containers of hazardous waste must be properly labeled. The waste chemicals must be identified by their
- **proper chemical name (not formulas**),
- include proportions of a mixture.
- The label must say **"HAZARDOUS WASTE**". The label must be completed before it will be accepted for disposal by the **Safety Contact Person, Dave Makovsky**.
- Date the waste when it is put into the hazardous waste storage location.
- All waste must be kept in **sealed containers** at all times, unless you are actively pouring into the container. Zip-loc bags for dry debris must also be labeled and sealed**.**
- **Do not evaporate waste.**
- Do not mix incompatible wastes. Ensure the waste container is compatible with the waste and use the appropriately sized container.
- Indiscriminate disposal by pouring waste chemicals down the drain or adding them to refuse for landfill burial or evaporation is unacceptable.
- Once a container is **full,** contact the Safety Contact Person, Dave Makovsky, as soon as possible to arrange for an appropriate storage location and hazardous waste disposal pickup through certified waste haulers.
- Have and maintain separate containers for trash and broken glass.
- Waste disposal method: As written in lesson plans using guidelines above and those found in the Suggested Disposal Procedures in the current FLINN Catalog and Reference manual found in Room D106 are to be performed.

14. SPECIFIC SAFE WORK PRACTICES BY HAZARD:

A. PROCESS: When mixing and handling various concentrations of hazardous materials, minimize chemical exposure by reducing the amount of time working with them and keeping containers closed whenever possible.

B. HAZARDOUS CHEMICALS/CLASS OF HAZARDOUS CHEMICALS: Substitute low toxicity chemicals for ones with high toxicity. This enhances personal safety and reduces impact to the environment in terms of waste disposal. Following are groups of hazards.

* ***Liquid Corrosives*** * ***Solid Corrosives*** * ***Volatiles*** * ***Reactives:***

C. SPECIAL HANDLING PROCEDURES AND STORAGE REQUIREMENTS: One shall always regard unknowns to be toxic. Any mixture of toxic compounds is presumed to have a synergistic effect, namely, the toxicity of the whole is greater than the sum of each component. Any special handling requirements shall be noted on the Chemical Hazards Preparation Form.

Use the guidelines below in part **D**, the MSDS for the chemicals, and hazard information in Appendix A and B of 1910.1200 and the NIOSH Pocket Guide, http://www.cdc.gov/niosh/npg/ to assess the hazards, select the PPE, develop the safe work practices and emergency response procedures, etc. needed to complete the Chemical Hazards Preparation Form in Appendix A. These procedures will be in addition to the general safe work practices outlined earlier in this Plan.

D. CHEMICAL HAZARD INFORMATION FOR A SPECIFIC COMPOUND: Knowing the hazards of a chemical and how to properly handle and dispose of these compounds, including during the Pre and Post-Lab operations, will help prevent harmful and unnecessary exposures.

For all compounds:

Work shall be performed with the smallest possible amount of the chemical or determine if a less hazardous chemical or process could be used as a replacement.

Containers shall be kept closed as much as possible to reduce potential for spilling and exposure to vapors.

Contaminated gloves shall be removed before using a writing implement to take notes.

High Acute Toxicity, Reproductive Toxins, Carcinogens:

First, try to replace them with less hazardous materials.
Second, use videos or other methods of getting the lesson across.
If that fails then the Laboratory standard requires:
Specific consideration shall be given to the following provisions which shall be included where appropriate:

- Establishment of a designated area;
- Use of containment devices such as fume hoods or glove boxes;
- Procedures for safe removal of contaminated waste; and
- Decontamination procedures.

All use of such chemicals shall only be conducted with prior approval of the Chemical Hygiene Officer.

OSHA 1910.1200 Appendix A Health Hazard Definitions:

Reproductive toxins means chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

Select carcinogen means any substance which meets one of the following criteria:

(i) It is regulated by OSHA as a carcinogen; or
(ii) It is listed under the category, "known to be carcinogens," in the Annual Report on Carcinogens published by the National Toxicology Program (NTP)(latest edition); or
(iii) It is listed under Group 1 ("carcinogenic to humans") by the International Agency for research on Cancer Monographs (IARC)(latest editions); or
(iv) It is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:

(A) After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m(3);
(B) After repeated skin application of less than 300 (mg/kg of body weight) per week; or
(C) After oral dosages of less than 50 mg/kg of body weight per day.

"Highly toxic:" A chemical falling within any of the following categories:

(a) A chemical that has a median lethal dose (LD(50) of **50 milligrams or** less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
(b) A chemical that has a median lethal dose (LD(50)) of **200 milligrams** or less per kilogram of body weight when administered by **continuous contact** for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.
(c) A chemical that has a median lethal concentration (LC(50) in air of **200 parts per million** by volume or less of gas or vapor, or **2 milligram**s per liter or less of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

"Toxic." A chemical falling within any of the following categories:

(a) A chemical that has a median lethal dose (LD(50)) of more than 50 milligrams per kilogram but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
(b) A chemical that has a median lethal dose (LD(50)) of more than 200 milligrams per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.
(c) A chemical that has a median lethal concentration (LC(50)) in air of more than 200 parts per million but not more than 2,000 parts per million by volume of gas or vapor, or more than two milligrams per liter but not more than 20 milligrams per liter of mist, fume, or dust, when

administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

Many of these have OSHA Expanded Standards, a standard all their own with specific safe work practices, medical evaluation, air monitoring, and recordkeeping requirements. These include:

1910.1001 Asbestos
1002 Coal tar pitch
1910.1003 13 carcinogens

4-Nitrobiphenyl, Chemical Abstracts Service Register Number (CAS No.) 92933;
alpha-Naphthylamine, CAS No. 134327;
methyl chloromethyl ether, CAS No. 107302;
3,3'-Dichlorobenzidine (and its salts) CAS No. 91941;
bis-Chloromethyl ether, CAS No. 542881;
beta-Naphthylamine, CAS No. 91598;
Benzidine, CAS No. 92875;
4-Aminodiphenyl, CAS No. 92671;
Ethyleneimine, CAS No. 151564;
beta-Propiolactone, CAS No. 57578;
2-Acetylaminofluorene, CAS No. 53963;
4-Dimethylaminoazo-benezene, CAS No. 60117; and
N-Nitrosodimethylamine, CAS No. 62759.

1004 alpha napthylamine
1006 methyl chloromethylether
1007 3,3’ dichlorobenzadine and salts
1008 bis chloromethyl ether
1009 beta napthylamide
1010 benzidine
1011 4 aminodiphenyl
1012 ethyleneimine
1013 B-propiolacetone
1014 2 acetylamino fluorine
1015 4 dimethylaminoazobenzene
1016 N-Nitrosodimethylamine
1017 vinyl chloride
1018 Inorganic Arsenic
1025 lead
1026 Chromium
1027 cadmium
1028 benzene
1029 coke oven emissions
1043 Cotton dust
1044 1,2 dibromo-3-chloropropane
1045 acrylonitrile
1047 ethylene oxide
1048 formaldehyde
1050 methylene dianiline
1051 1,3 butadiene

1052 methylene chloride

1910.1200 definition
Toxic chemicals that do not meet the level above still must have safe work practices developed based on the chemicals specific characteristics and hazards.

- Can the chemical be absorbed through the skin to cause adverse systemic health effects?
- Will the chemical irritate the skin or eyes sufficiently to require safe work practices or PPE?
- Can the students take what is before them and make something more hazardous?
- Does the chemical have to be cut, introducing a sharps hazard?
- Is the chemical so light and fluffy it is easy to inhale or will adhere to gloves, clothing and hands via static electricity?
- Will it generate heat during the lesson?
- Will it generate harmful light that requires eye shades?
- Will it make a huge, hazardous, difficult to remove mess?
- Will it be so smelly it has to be completely used in the hood?
- Will the reaction startle the students potentially causing them to trip or drop inconvenient things?

Think each lesson through to find the high hazard points, whether physical or chemical. And then address them.

Corrosive Solids: Corrosive means a chemical that causes visible destruction of or irreversible alterations in living tissue by chemical action at the site of contact. Corrosive solids, such as sodium hydroxide and phenol, can cause burns to the skin and eyes. Dust from corrosive solids can be inhaled and cause irritation or burns to the respiratory tract. Many corrosive solids, such as potassium hydroxide and sodium hydroxide, can produce considerable heat when dissolved in water.

The following work practices shall be followed when handling, storing and disposing of corrosive solids:

1. Do not bring out the chemical until the classroom is calm and set the students up for the least amount of traffic around the bench work area.

2. Remove all non essential chemicals, books, equipment, etc. from the work area prior to placing the corrosive solid on the bench.

3. When mixing with water, always slowly add the corrosive solid to water, stirring continuously. Caution, some water reactive corrosive solids can 'skitter' across the surface and may 'jump' out of the container.

4. Review the potential hazards from the corrosive solid and from the process to select the engineering and work practice controls necessary to protect the teacher and students.

    a. Where heat is a byproduct of the process the glassware selected shall be heat resistant and heat resistant gloves that can be worn over the chemical resistant gloves shall be available. Also, any flammable material not required for the lesson shall be moved away from the work area and the work.

    b. If there is a possibility of generating a significant amount of dust, hazardous vapors, volatile reaction that produces gas, potential for explosion or material bubbling or splashing out of the container then conduct work in a fume hood.

5. Wear gloves and eye protection when handling corrosive solids. Refer to Appendix F Chemical Inventory for proper glove choice. Remove, rinse or replace gloves before taking off the eye protection.

6. Waste disposal method: where necessary due to potential hazards, such as generation of heat, corrosive solids shall be disposed of in segregated, labeled waste.

Corrosive Liquids: Corrosive liquids (e.g. mineral acids, alkali solutions and some oxidizers) represent a very significant hazard because skin or eye contact can readily occur from splashes and their effect on human tissue generally takes place very rapidly. Bromine, sodium hydroxide, sulfuric acid and hydrogen peroxide are examples of highly corrosive liquids.

The following work practices shall be followed when handling, storing and disposing of Corrosive liquids:

1. The eyes and hands are particularly vulnerable. It is therefore essential that approved eye and face protection be worn in all laboratories where corrosive chemicals are handled.

2. Gloves and other chemically resistant protective clothing **and a lab coat** shall be worn to protect against skin contact. Refer to the gloves in Appendix F Laboratory Chemical Inventory for proper glove choice and include all PPE in the Chemical Hazards Preparation Form.

3. To avoid a flash steam explosion due to the large amount of heat evolved, always add acids or bases to water (and not the reverse). These mixtures shall be performed in the fume hood. See corrosive solid section for management of heat hazards.

4. Acids and bases shall be segregated for storage. Nitric Acid shall be isolated in the acid storage cabinet.

5. As with all chemicals, liquid corrosives shall be stored below eye level.

6. Adequate quantities of spill control materials shall be readily available. A spill kit for acids and bases is available in classroom D106.

7. Waste disposal method: ensure that the waste container, properly labeled is available and has sufficient space for the type of corrosive used and the products, including mistakes, of the lesson prior to beginning the preparation phase.

Reactives: Reactive chemicals are substances that can explode or enter into violent reactions releasing large amounts of light, heat, and gases. A number of reactive chemicals are recognized explosives, requiring only a mild initiating force for detonation. Other reactive chemicals are capable of detonation but require a stronger initiating force. Some reactive chemicals will not detonate but can enter violent reactions producing large quantities of heat and explosive gases. Reactive chemicals must be handled with extreme care, even milligram quantities of some chemicals can result in violent explosions.

Classes of Reactives: While almost all chemicals will react with something some chemicals are so reactive that the reaction can create a hazard. Reactive chemicals are classified as explosives, strong oxidizing or reducing agents, acid sensitives, water reactives, air reactives, and special organic compounds.

- ***Solid Reactive*** examples include sodium, potassium and lithium metals; acid anhydrides, acid chlorides and salt hydrides.

- ***Liquid Reactives*** are chemicals that react vigorously with moisture, oxygen or other substances. Examples include organic halides, phosphorous trichloride, titanium tetrachloride, butyl lithium, and hydrazine.

The following work practices shall be followed when handling, storing and disposing of Reactive chemicals:

1. Quantities shall be limited to the amount necessary for the work in progress.

2. Water reactives cannot be stored in the same room with combustible or flammable materials, 1910.106(d)(7)(iii).

3. Safety glasses, face shield, gloves, and a laboratory coat shall be worn at all times when handling, transporting, or manipulating reactive chemicals.

4. Adequate and appropriate portable fire extinguishers shall be immediately available in the laboratory.

5. Approved eye-wash stations and emergency showers must be in working order. Safety shields shall be used as necessary.

6. Prior to bringing the chemical from the storage area the work bench shall be cleared of all materials not immediately required for the lesson or process.

7. Explosives shall be protected from heat and shock and shall be purchased or made immediately prior to the class and thoroughly disposed of properly afterwards.

8. Clean up spills immediately. The safest method is to absorb the material onto vermiculite or a similar loose absorbent. Verify they absorbent material is compatible and will be effective before the prep for the lesson and include the specific spill method in the Chemical Hazards Preparation Form.

9. Waste disposal method: prior to use of the chemical the method for disposal shall be prepared to ensure it is not added to a waste container with materials it will react to and that in the future such chemicals shall not be added to the container the reactive chemical is in. The waste container shall immediately be labeled as to its contents to reduce such a problem in the future.

Volatile Chemicals: Volatile organic compounds (VOCs) are emitted as gases from certain solids or liquids. VOCs include a variety of chemicals, some of which may have short- and long-term adverse health effects. (examples: hexanes, ***acetone***, methylene chloride, diethyl ether)

The following work practices shall be followed when handling, storing and disposing of Volatile chemicals:

1. The potential for absorption through the skin with adverse health effects shall be carefully evaluated and special attention shall be paid to glove selection.

2. Any part of the process that could cause splashing to the arms or body shall be evaluated and engineering and work practice controls developed and noted on the Chemical Hazard Preparation Form.

3. Work areas shall be cleared of anything that produces a spark or flame.

4. Highly flammable volatiles that could ignite with static electricity sparks are discouraged from purchase or use but if they are then the Form should include the steps that will be taken to ensure the safest environment possible. [no sweaters, means for grounding the body before touching containers or equipment, sneakers, etc.]

5. No more than 10 gallons of flammable and combustible liquids, combined, shall be stored outside of a flammable storage cabinet unless safety cans are used. When safety cans are used, up to 25 gallons may be stored without using a flammable storage cabinet.

6. Prior to working with volatiles verify fume hood is in working order and has sufficient room for the equipment, materials, and motion required for the process.

7. Work in the fume hood to ensure proper ventilation when working with volatile chemicals.

8. When carrying volatile chemicals through the lab, carry them in a covered container and the bottle or container shall be capped, closed, etc.

9. Work with smallest amounts possible and keep containers closed or covered as much as possible to minimize the amount of volatile gases into the room.

10. Waste disposal method: As written in lessons plan and to be performed in compliance with the CHP and all current local, state and federal regulations.

Appendix A. Preparation for Hazards of working with Chemicals.

Use the following Form when preparing for a laboratory procedure that involves the use of hazardous chemicals and attach to the lesson plans. Focus on procedures found in the CHP, along with the information you can find on line, within the 1910.1000, and the MSDS provided with the chemicals to develop safe work practices in the laboratory.

Never underestimate the hazards associated with the laboratory. If you are unsure about what you are doing, get assistance. Do not use unfamiliar chemicals, equipment, or procedures alone.

Know incompatibilities of the chemicals involved.

Replace highly hazardous chemicals with those with lower hazards whenever possible.

IMPORTANT: The five prudent practices of chemical safety sum up these safety guidelines:

1. Treat all chemicals as if they were hazardous.
2. Minimize your exposure to any chemical.
3. Avoid repeated exposure to any chemical.
4. Never underestimate the potential hazard of any chemical or combination of chemicals.
5. Assume that a mixture or reaction product is more hazardous than any component or reactant.

When using chemicals during a lab, the teacher will follow guidelines provided in the Chemical Hazards Preparation Form developed from the MSDS and ensure all PPE and engineering controls required are provided and in working order prior to starting the preparation phase of the procedure.

This Form shall be completed and attached to each lesson plan for implementation.

First select all on the next page, copy and paste to a separate document. When complete store with the Chemical Hygiene Plan for future use.

C·E·S·A 10
Cooperative Educational Service Agency

Chemical Hazards Preparation Form
Lesson: _____

Chemicals identified to be used:

Name	Compatible with other chemicals?
_____	___Yes ___No
_____	___Yes ___No
_____	___Yes ___No

Replacement of incompatible or high hazard chemicals evaluated? ___Yes ___No

Check the Row(s) below and column(s) to the right indicating what safety equipment and procedures are to be used and when they shall be followed.			**Pre-Lab**	**Lab**	**Post-Lab**
Hazard Category **Check all that apply**		**Corrosive Solid**			
		Corrosive Liquid			
		Reactive			
		Volatile			
		Other: _____			
PPE - Personal Protection Equipment **Check and circle**		**Safety Glasses**			
		Goggles			
		Splash Shield			
		Gloves: [list types gloves available]	[ID glove]		
		Body Protection: Apron, lab coat			
		Foot : in addition to covered foot/toe areas			
		Respiratory, for those in the Program			
Engineering Controls **Check all that apply**		**[list what's available, splash guard, etc.]**			
		Use Fume Hood			
		Eyewash Station in working order			
		Safety Deluge Shower in working order			
		Use diluted or small quantities of hazards			
		Type of Fire Extinguishers required			
Waste Disposal **Check all that**		**Pour down drain**			
		Chemical Garbage can			
		Type of Segregated Waste Container i.e. Acids			
List any hazardous products, by products or wastes that may be created anytime during the use of the chemical identified above. **** Handle and Dispose of properly.***		1.			
		2.			
		3.			
		4.			

Specific Safe Work Practices: [list the safe work practices expected to be used in each stage, if all the same just write once.]

Specific emergency procedures: [especially important for chemicals that are incompatible with usual spill kit or fire extinguishing materials

Appendix B

I. Emergency First Aid Procedures

a) *Eye Contact:* Lead individual to the ***nearest emergency eyewash station*** and ***flush eyes*** with copious amounts of water for at least ***15 minutes*** **then** seek medical attention if deemed necessary according to MSDS.

b) *Ingestion/Inhalation:* Read the label on the bottle or check MSDS for directions and immediately seek medical attention. Contact the 24-hour emergency poison control center at 1-800-336-6997. Notify the CHO of the occurrence.

c) *Minimal Skin Contact:* Direct individual to the nearest sink and flush the affected area(s) with copious amounts of water and remove any contaminated clothing. Check MSDS for directions and immediately seek medical attention if symptoms persist after flushing.

d) *Major Spill on Body:* Direct individual to the safety/deluge shower located within the lab and flush the affected areas with copious amounts of water and remove any contaminated clothing. Check MSDS for directions and immediately seek medical attention if symptoms persist.

Appendix C. CHEMICAL HYGIENE PLAN ANNUAL REVIEW AND/OR EVALUATION

Date Reviewed Noted on front?	Reviewed by	Changes and/or Revisions

Appendix D. General Laboratory Safety Student Checklist

Name: _____

Safety Rules		Date Covered	Initial signifying your understanding
a)	Wash hands before and after work, and after spill cleanups.		
b)	Do not smell or taste chemicals.		
c)	Never work alone in a science laboratory or storage area and do not allow students to work unsupervised.		
d)	Never eat, drink, smoke, chew gum, or tobacco in the laboratory environment.		
e)	Never store food in laboratory refrigerators.		
f)	Never pipette liquids by mouth.		
g)	Restrain loose clothing, long hair, and dangling jewelry.		
h)	Never leave heat source unattended (gas burners, hot plate, mantels, etc.)		
i)	Do not mix chemicals in the sink drain.		
j)	Always inform co-workers and students of plans to carry out hazardous work.		
k)	Avoid horseplay, practical jokes, and any other distracting behaviors.		
l)	Be alert to unsafe conditions and correct them when detected.		
m)	Exercise great care in noting odors or fumes. Use a wafting motion of the hand to note a small amount of odor.		
n)	Use the fume hood when working with chemical emitting harmful vapors.		
o)	Mix concentrated acid into water carefully, as it may splash out, and it generates a large amount of heat.		
p)	Wear safety equipment when performing labs that require it.		
q)	Report all accidents, injuries, or near misses to instructor or the CHO.		
r)	Always keep work area clean and combustible material away from open flames.		
s)	Know the location and how to use all the safety equipment in the laboratory.		
t)	Know the location and has an understanding of the gloves in Appendix F, Chemical Inventory and which gloves to use.		
u)	Review and understand the Chemical Hazards Preparation Form before beginning work with chemicals.		

Appendix E.

Checklist for periodic inspections on safety equipment and procedures

**This checklist will used of as a record for testing and inspection purposes*

Inspection of Classroom Procedures in Accordance with the Chemical Hygiene Plan **Frequency A: Annual; B: Biannual; Q: Quarterly; M: Monthly W: Weekly**		**Frequency**	**Date & Initials**	**Date & Initials**	**Date & Initials**	**Date & Initials**
Part I	Chemical Hygiene Officer has been Identified	A				
Part II	Reviewed Guidelines for working with laboratory chemicals.	A				
	1. Specifics to Hazard Prevention have been reviewed	A				
	a. Fire or emergency drills conducted and reviewed					
	b. Emergency phone numbers updated and posted by each telephone					
	c. Accidents have been analyzed to prevent recurrance	A				
	d. Inspect glassware for damage					
	2. Specifics to General Laboratory Safety have been reviewed by teacher and laboratory students.					
	3. *Specifics to* Facility Maintenance have been reviewed					
	a. Fire extinguishers are placed near high hazard areas.					
	b. Fire extinguishers are inspected.	M				
	c. Escape routes are not blocked					
	d. Fire doors are not blocked					
	e. Materials are not stored in aisle ways.					
Part III	Reviewed the Laboratory (Class room) Guidelines					
	1. Equipment inspection					
	Safety Showers are inspected and working.	W				
	Eyewash stations are inspected and working.	W				
	2. Ventilation systems including fume hood inspected and working.					
Part IV	Reviewed the Components of the Chemical Hygiene Plan					
	1. Reviewed and understand the procurement procedures.					
	- MSDS are being maintained and accessible at: https://msdsmanagement.msdsonline.com/?ID=D4F45D74-43A3-4AA7-8712-18EFA8F2045D					
	2. Storage procedures are reviewed and understood					
	- Toxic substances are segregated and off limits to students					
	- Stored chemicals have been examined for integrity					
	- Chemicals are being stored and inventoried in accordance with accepted standards of compatibility.	A				
	- Flammable and Corrosive materials are stored in proper cabinetry with closable doors.					
	3. Distribution procedures of chemicals from storage area are reviewed and understood.					
	4. Air monitoring procedures are reviewed, understood and being followed.					

		Frequency	Date & Initials	Date & Initials	Date & Initials	Date & Initials
Part IV	(cont. 2. Storage)					
	5. Housekeeping procedures are continued being reviewed and followed.	A				
	6. Medical program and procedures have reviewed and understood.					
	7. Teacher/Students have access to *Protective equipment and apparel* procedures have been reviewed and understood.					
	- Access to Splash goggles and safety glasses are available and in good shape.					
	- Access of Chemical resistant aprons are available					
	- Gloves in Appendix F Chemical Inventory and access to Gloves are available.					
	- Proper footwear is being maintained in the laboratory.					
	8. Records of accidents are kept and reviewed.	A				
	9. Proper signs and label procedures reviewed, maintained and understood.					
	- Identifying labels are on all chemical containers					
	- Posted Food and Beverage signs prohibiting their use.	A				
	- Posted signs are maintained leading to chemical storage areas.	A				
	- Unknown samples are properly labeled and stored.					
	- All chemicals are accurately labeled with precautionary information and handling procedures.					
	10. Reviewed and understand procedures during and after a *Chemical Spill*.					
	11. Information and Training of the *Chemical Hygiene Plan* is being conducted and maintained.	A				
	12. Proper waste disposal programs are being administered, understood and maintained.					
	- Broken glass containers are available and separate from trash containers.					
	13. Review Handling Procedures of hazardous materials.					

Appendix F. Laboratory Chemical Inventory

Quantities & Integrity will be inspected annually.

Chemical Name	Glove type*	Purchase Date	MSDS?	Compatible Storage Location

Date inspected:_____ Inspected by: _____

*By brand name or glove type + thickness where required by type of hazard and use

Appendix G. Glove Selection

Some Common Sense Rules for Glove Selection:

- **First, do you need gloves: is the hazard a manageable irritant or will it absorb and cause sterility and/or deafness (Carbon Disulfide)**
- **Second, evaluate the conditions of use, will there be splashes, mists, droplets, sharp objects, heat, etc.**
- **Third, consult the relevant MSDS which may recommend a particular material but usually the chemical manufacturer will not take the liability.**
- **Fourth, if the MSDS says "chemical resistant" or glove material but no thickness then contact your glove manufacturer and ask if you can fax MSDS and get advice on which of their products will work best for the largest number of chemicals that you have, include double gloving as an option**
- **Note the glove selection by material and thickness (in case you find a cheaper provider or the manufacturer stops making "Whizbang Glove #3")**
- **Select gloves of the correct size and fitting to reduce likelihood of tearing or interference with dexterity.**

The hazard assessment shall be done in compliance with the OSHA standard on general requirements for personal protective equipment (29 CFR 1910.132). Glove Selection shall be specific to the hazard, the tasks being performed, and in compliance with the OSHA standard on hand protection (29 CFR 1910.138).

The result of the hazard assessment will be noted on the inventory.

Some Common Sense Rules for Glove Use:

- **Before use inspect gloves for physical damage and check for expiration date.**
- **When the process creates splashes either change the procedure, rinse the external surface frequently with water, or change gloves frequently.**
- **Remove gloves when tears or punctures are observed.**
- **Remove gloves in a way that avoids the contaminated exterior contacting the skin. Dispose of contaminated gloves properly. Do NOT reuse gloves.**
- **Check your hands and wrists for redness or discoloration indicating exposure after removal of gloves.**
- **Wash hands after removing gloves.**
- **Always remove your gloves when you turn away from the bench. If your project requires writing down information the following options may be used:**
  - Dictate notes to a classmate or student
  - Remove gloves, write notes on a surface other than the work bench, then put on new gloves

Appendix H - Biology Laboratory Safety

Safety and Health Hazards specific to the Biology labs include:

- Dissection of specimens preserved in very dilute formaldehyde with sharp implements
- Handling live specimens

Handling Dissecting Instruments and Preserved Specimens

1. Preserved specimens showing any signs of decay should not be used for any type of lab observation or dissection.
2. Disecting instruments, such as scissors and scalpels, are very sharp. Always use a cutting motion directed away from yourself.
3. In performing a dissection make sure the specimen is pinned down firmly in a dissecting tray before beginning work.
4. Use your instruments with care. In general, very little force is necessary for making incisions. Excess force will most likely damage delicate tissues.
5. Never touch your eyes while handling preserved specimens. Wash hands thoroughly with soap and water after working with specimens.
6. Order the minimum number of specimens and discard, with preservative solution, at end of use.
7. Identify the hazards of the preservative solution used for the specimens and develop work practice controls, provide engineering, and/or PPE prior to obtaining the specimen

Handling Living Specimens

1. Understand clearly the purpose and procedure of the activity before you begin work.
2. Animals should be handled gently so as not to produce undue excitement or trauma.
3. Avoid subjecting specimens to stressful conditions such as exhaustive exercise or painful stimuli.
4. Where there is potential for biting leather gloves shall be worn.
5. Identify any hazard presented by the live specimen: such as toxoplasmosis from cat litter dust, venom, allergens, etc. and develop work practice controls, provide engineering, and/or PPE prior to obtaining the specimen

Appendix I - Medford Complete Chemical Inventory

Please refer to Google Docs (owner – Jennifer Kuenne):

Chemical Hygiene Inventory – DO
Chemical Hygiene Inventory – MAES
Chemical Hygiene Inventory – MAMS
Chemical Hygiene Inventory – MASH
Chemical Hygiene Inventory - SES