Art and Theatre Safety Procedures

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1 INTRODUCTION

The goal of the Keene State College Chemical and Safety Procedures for the Arts & Humanities is to minimize the risk of injury or illness to students and staff by ensuring that they have the training, information, support and equipment needed to work safely in the art studios and workshops. This plan has been prepared as a companion document to the "*Chemical and Biological Safety Procedures for the School of Sciences and Social Sciences"* and the "*Hazardous Waste Disposal Procedures*", which provide detailed procedures regarding chemical handling and hazardous waste management, respectively. If discrepancies are noted between these documents, the companion documents will take precedent over this document.

Sections 1 through 6 contain general safety and emergency preparedness procedures that are applicable to all studios and workshops. Section 7 contains specific safety information for the Studio Arts/Graphic Arts and Section 8 provides detailed information for Theatre programs.

1.1.Keene State College Policies

1.1.1 Environmental, Health and Safety Policy

Keene State College is committed to providing a safe and healthy environment for its students, employees and campus visitors. Such an environment is essential for the College to meet its mission of instruction, research and public service. Keene State meets this obligation by complying with the University System of New Hampshire (USNH) Policy on Environmental Health and Safety, as well as state and Federal environmental, health and safety (EHS) regulations.

Ways to implement the above policy include:

- Developing and improving programs and procedures to assure compliance with all applicable laws and regulations;
- Ensuring that personnel are properly trained and provided with appropriate safety and emergency equipment;
- Taking appropriate action to correct hazards or conditions that endanger health, safety, or the environment;
- Evaluating safety and environmental factors in all operating decisions (including planning and acquisition);
- Engaging in sound reuse and recycling practices and exploring feasible opportunities to minimize the amount and toxicity of waste generated;
- Using energy efficiently throughout our operations;
- Encouraging personal accountability and emphasizing compliance with standards and conformance with College policies and best practices during employee training and in performance reviews;
- Communicating our desire to continuously improve our performance and fostering the expectation that every employee, student, and contractor on College premises will follow this policy and report any environmental, health, or safety concern to Keene State College management; and,
- Monitoring our progress through periodic evaluations.

1.1.2 Security Policy

All faculty and staff are responsible for safeguarding College resources from unauthorized access, misuse or removal. In art studios and workshops, this obligation rests primarily with the faculty; however, all personnel have a responsibility to take reasonable precautions against theft or misuse of materials, particularly those that could threaten the public. Any extraordinary security measures should be commensurate with the potential risks and imposed in a manner that does not unreasonably hamper creative research.

At a minimum, the institution expects all personnel to comply with the following security procedures:

- Question the presence of unfamiliar individuals in laboratories and report all suspicious activity immediately to Campus Safety by calling 358 2228; and,
- After normal business hours, all rooms or cabinets that contain hazardous chemicals or equipment must be locked when not in use.

To minimize the likelihood of unauthorized access, all after-hours building users should:

- Avoid providing building access to unfamiliar individuals;
- Secure doors behind them when leaving and entering; and,
- Immediately report any building security problem to Campus Safety at 358-2228.

Research or other activities involving the use of art space, materials or equipment without the knowledge and approval of the responsible faculty or supervisor is strictly prohibited. Violation of this prohibition may result in disciplinary action up to and including termination. (for students, termination?)

1.2 Roles and Responsibilities

1.2.1 Environmental Health and Safety (EHS)

The EHS Officer shall:

- Conduct exposure monitoring, as needed;
- Provide general EHS training;
- Audit the departmental program periodically;
- Provide consultation for safe working guidelines for studio workers;
- Review the Art Safety Plan at least annually;
- Coordinate annual fume hood inspections;
- Provide consultation for safe work practices for hazardous chemicals; and.
- Inspect hazardous waste satellite accumulation areas and arrange for hazardous pickup and disposal.

1.2.2 Chemical and Biological Safety Committee

Keene State College has established a Chemical and Biological Safety Committee (CBSC). The members of this committee are appointed by the Provost to improve conditions specific to this college.

It shall be the responsibility of this committee to

- Work to create a proactive and positive approach to chemical and biological safety;
- Establish safety and health policies in accordance with Federal, state and local regulations;
- Evaluate and document (in writing) research and laboratory and fieldwork activities being conducted by KSC faculty, staff and students for safety and health considerations;
- Establish and implement a Chemical and Biological Safety Plan for the Sciences and a Chemical and Safety Plan for the Arts;
- Review and update the Plan(s) at least annually;
- Provide an annual report to the Principal Administrators;
- Communicate any changes to the Keene State College community; and,
- Conduct laboratory/studio visits as a means of supporting on-going measures to ensure that Keene State College maintains a safe working environment for students, faculty, and staff.

1.2.3 Departmental –Faculty and Staff

Faculty and staff within the School of Arts and Humanities are responsible for the following activities:

Department responsibilities include:

- Ensuring staff and students understand how to work with chemicals and equipment safely;
- Providing appropriate engineering controls and personal protective equipment needed to work safely with hazardous materials, and ensuring such equipment is used correctly;

- Maintaining communication between the department and EHS for safety issues;
- Maintaining records of training, chemical Material Safety Data Sheets (MSDS).
- Ensuring faculty, staff, and students receive chemical and procedure-specific training, including attendance at general training given by EHS;
- Maintaining Spill Kits and First Aid Kits as appropriate to materials in the area;
- Ensuring staff and students are aware of the "Right to Know" law and have access to MSDS's at any time;
- Reviewing and approving use of and/or work with particularly hazardous substances;
- Investigating and documenting accidents, chemical exposures and near misses within the department; and,
- Approving faculty or staff's return to work following a chemical exposure requiring medical consultation.

Faculty responsibilities include:

- Staying up to date on current safety practices and environmental regulations by attending and participating in all required training workshops and/or on-line training;
- Faculty are responsible for ensuring that all activities involving the use of chemicals or other potentially hazardous activities are reviewed and approved by the Chemical and Biological Safety Committee prior to conducting any new projects;
- Ensuring staff and students understand how to work with chemicals safely;
- Providing staff and students with appropriate engineering controls and personal protective equipment needed to work safely with hazardous materials and equipment, and ensuring such equipment is used correctly;
- Ensuring staff and students receive chemical and procedure-specific training, including attendance at general training give by EHS;
- Ensuring staff and students are aware of the "Right to Know" law and have access to MSDS's at any time;
- Reviewing and approving use of and/or work with particularly hazardous substances;
- Investigating accidents and chemical exposures within the department;
- Approving staff or students' return to work following a chemical exposure requiring medical consultation; and,
- Adjunct faculty activities that involve the use of chemicals and equipment must be approved by the Department chairperson or his/her designee.

1.2.4 Studio/Workshop Worker (student or staff)

The workers—both students and staff-- responsibilities are to:

- Attend safety training;
- Review the relevant safety procedures;
- Follow procedures and practices outlined in the Chemical and Safety Plan and Specific Safety Programs and other protocols as provided by the Dean, Department Chairs, supervisors, and principal investigators;
- Use engineering controls and personal protective equipment, as appropriate; and,
- Report all incidents, accidents, potential chemical exposures and near miss situations to the departmental supervisors and the EHS Manager (358 2879).

2 GENERAL SAFETY PROCEDURES

2.1 General Safety Procedures

The following safety procedures should be followed by all persons in the art studios and workshops:

- Know the materials you are working with: Refer to written protocols and review the Material Safety Data Sheets (MSDS) for chemicals. Consider the toxicity of materials, the health and safety hazards of each procedure, the knowledge and experience of personnel, and the safety equipment that is available.
- Know the location of safety equipment and emergency procedures in your area.
- Always wear appropriate clothing (e.g. pants, shirts, closed-toed shoes) and personal protective equipment (e.g., safety glasses, lab coats, gloves) whenever chemicals and equipment are used. Remove personal protective equipment before leaving the studio or workshop.
- Do not work alone in the building at any time. When hazardous operations are conducted, arrangements should be made to have another person present in the lab.
- Use a properly operating fume hood when working with hazardous chemicals.
- Do not eat, smoke, drink, chew gum, prepare food or apply cosmetics in rooms where hazardous chemicals are being used or stored.
- Keep work areas clean and uncluttered at all times.
- Unauthorized individuals are prohibited from entering the studios or workshops.
- Non-assistance animals (e.g., not including guide dogs) are not allowed in campus buildings.
- Refer to Safety Guide for Art Studios (http://www.unh.edu/ehs/pdf/EU-Art-Safety-Brochure.pdf) and Environmental Health & Safety in the Arts (http://www.epa.gov/region2/children/k12/english/EHS-in-the-arts.pdf) in addition to this manual for other safety procedures.

2.2 Safety Training

At the beginning of each semester, every instructor must review the applicable safety protocols with their classes before students are permitted to work with hazardous materials or equipment. This can be accomplished through instruction, viewing a safety video such as “Learning Art Safely” or a combination of the two. Appendix A provides the basic safety instruction topics that should be included in this training.

Instructors should have their students sign a safety contract. It is the responsibility of the instructor to maintain the safety contracts on file. A sample safety contract is included in Appendix A.

2.3 Security

Security is an integral part of an effective safety program. Follow these steps to ensure a secure working environment in your studio or workshop:

- Keep doors locked when unoccupied.
- Keep an accurate record of chemicals, project materials, and other items that support project activities.
- Notify KSC Campus Safety at 358-2228 if materials are missing from studios and laboratories.
- Inspect all packages arriving at the work area.
- When work is completed for the day, ensure that chemicals and potentially hazardous equipment have been stored properly and securely.
- Ask strangers (someone you do not recognize as a co-worker or support staff person) to exit the room if they are not authorized to be there.
- Discuss other security-specific requirements with your supervisor and colleagues.

2.4 Safety Equipment

In areas where chemicals are used, drench showers, eye washes and fire extinguishers are located next to the main door of the facility for occupant safety. A hazard (chemical, fire or personal injury) should not come between you and your safe egress from the room.

2.4.1 Drench Showers

Drench showers and other emergency wash systems are used in an emergency to flush chemicals that have accidentally come in contact with laboratory personnel. In order to wash the body properly, clothing should be removed as water is applied. The drench shower can be used to extinguish a clothing fire, but this is not recommended if the shower is more than a couple of feet away. The best method of extinguishing a clothing fire is to "Stop, Drop & Roll," and then remove clothing.

At least three feet of space in each direction is required beneath the shower and this area must be kept free of all obstacles (i.e., no waste baskets, etc.). Physical Plant inspects drench showers annually for proper flow and operation. A "DO NOT USE" notice is placed on the unit if the shower is not properly functioning.

2.4.2 Eye and Face Washes

The best treatment for chemical splashes of the eye and face is immediate flushing with copious amounts of water for 15 minutes. Eye and face washes are equipped with a stay-open valve. All plumbed eye and face washes should be flushed by laboratory occupants on a weekly basis by allowing the water to flow for approximately 3 minutes to remove stagnant water from the pipes. Plastic eye wash bottles **are not recommended**.

In general, the emergency eyewash equipment should be installed within 10 seconds walking time from the location of a hazard. The equipment must be installed on the same level as the hazard (accessing the equipment should not require going up or down stairs or ramps). In addition, the path of travel from the hazard to the equipment should be free of obstructions and as straight as possible.

2.4.3 Open Floor Drains and Sink Traps

In order to reduce odors in buildings, sink traps and floor drains should be filled weekly with one to two liters of water. Floor drains that are not used for long periods of time should be checked regularly to assure that floor drains and sink traps are filled. No equipment should be placed over floor drains to obstruct this routine maintenance.

2.4.4 Fire Extinguishers

Fire extinguishers (ABC, dry chemical) are placed inside or in the hallway outside of classrooms and studios/workshops depending on the hazards. While not required, a fire extinguisher can be used by staff that have been trained and feel comfortable using the fire extinguisher in the event of an emergency.

2.4.5 First Aid Kits

First aid kits should be available in each studio/workshop. According to the American National Standards Institute (ANSI), the kit should contain the following:

Item and Minimum Size or Volume*	Minimum Quantity
Absorbent compress, 32 square inches (No side smaller than 4")	1
Adhesive bandages, 1" x 3"	16
Adhesive tape, 5 yards	1
Antiseptic, 0.5 gram application	10
Ice packs	2
Medical exam gloves (disposable)	2 pair
Sterile pads, 3" x 3"	4
Triangular bandage, 40" x 40" x 56"	1

* *Other items as needed.*

These kits should not have topical creams, liquids or ointments that can cause further discomfort and/or hinder medical treatment (except in labs using hydrogen fluoride or hydrofluoric acid, which are required to keep 2.5% calcium gluconate on hand for immediate first aid).

2.4.6 Spill Kits

Spill kits are available in each room where hazardous chemicals are used/stored and should only be used by those qualified staff or faculty with knowledge of the properties and hazards posed by the chemical, and any potential dangers posed by the location of the spill.

2.4.7 Sharps Containers and Glass Only Boxes

"Glass Only" boxes are used for the disposal of "clean" broken glass only. When ¾ full, the boxes should be properly sealed, labeled with the building/room number and disposed in a dumpster.

Sharps containers are used for the disposal of syringes, disposable blades such as X-Acto knives, razor blades and other sharp items. Containers for all sharps must be puncture-resistant. The sides and the bottom must be leakproof and they must be appropriately labeled. Containers for disposable sharps must be closable (that is, have a lid, flap, door, or other means of closing the container), and they must be kept upright to keep the sharps and any liquids from spilling out of the container. Use the following procedures for disposing of non-medical and non-hazardous sharps:

- Collect in puncture–resistant container (e.g. coffee can or used laundry detergent bottle). Make sure that there is NO biohazard symbol or label on the container!
- Close and seal when it is ¾ full
- Label the container "**Sharp Objects Inside – Use Caution when Handling**"
- Dispose of container in trash

2.5 Safety Information

MSDS, emergency procedures, safety manuals and other references should be readily available for all laboratory personnel. For additional resources, see the Chemical Environmental Management System (CEMS) web site at https://cems.unh.edu/keene/CEMS/Info.

2.5.1 Safety Door Postings

A CEMS hazard and emergency information sign should be posted on the door exterior, facing the corridor. This sign is used by emergency response personnel. The sign identifies hazards within the facility, the responsible faculty member and other persons to be contacted in the event of an emergency. In the event of an accident, chemical spill, fire or personal injury, assistance from a person familiar with the laboratory may be requested. EHS should be consulted about other door postings and signs that may be required to alert others that chemicals or other potential hazards are present.. Signs should be reviewed by the faculty member at least annually or in the event that pertinent information changes. Contact EHS at 358-2879 to request a new sign.

2.6 Room Inspections/Surveys

EHS surveys laboratories and studios annually. Room surveys may also be conducted following the report of a safety-related incident (See Section 5.5). The safety inspection includes: fume hood operation, laboratory techniques, emergency and safety equipment, chemical storage, electrical safety and general housekeeping. Additional safety surveys are conducted where hazardous waste is stored.

Following the safety survey, a report listing the hazard(s) is sent to the department chair responsible for the laboratory. The department is responsible for correcting the operational hazards (KSC is responsible for correcting all infrastructure deficiencies). If the department fails to correct the hazard, a notice is sent to the Dean of Arts and Humanities with a copy to the department chair. Follow-up surveys are conducted in laboratories or studios with extremely hazardous conditions and/or numerous violations.

In addition to these annual safety surveys, art faculty and personnel should update the chemical inventory and should periodically conduct their own safety inspections.

3 PERSONAL PROTECTIVE EQUIPMENT

3.1 Personal Protective Equipment Policy

The following personal protective equipment must be available for personnel and students who are working with hazardous materials. Studios/workshops must provide personal protective equipment (i.e. safety glasses, apron, etc.) for visitors and to post a sign indicating that eye protection is required where hazardous materials or equipment are in use.

Personal protective equipment is not supplied by EHS. However, EHS will assist with recommendations on specific types and uses of protective equipment.

3.2 Eye and Face Protection

Eye and face protection must be worn in art studios and workshops when there is a potential for contact with hazardous chemicals or other agents (e.g. aerosolized material, flying objects). All protective eye and face wear should meet ANSI Z87.1-1998 and ANSI Z136.1-2000 standards.

The type of protection needed depends on the hazard (e.g. chemical, ultraviolet light, laser, impact). For instance, when chemicals are used, approved eye protection is mandatory and chemical splash goggles are recommended. Goggles should be worn over eyeglasses or prescription safety glasses with side shields should be worn. Ordinary prescription glasses do not meet these standards. Likewise, contact lenses, by themselves, do not provide adequate protection in any environment in which the chance of an accidental splash of a chemical can reasonably be anticipated. Appropriate eye protection should always be worn in such situations (http://pubs.acs.org/cen/safety/19980601.html). Face shields should be worn when working with an agent that may adversely affect the skin on the face and/or when proper eye protection is not enough.

Eye, skin and face protection are required when working with severely corrosive or strongly reactive chemicals, with glassware under extreme pressures, in combustion and other high temperature operations and whenever there is a possibility of an explosion or implosion. Special safety glasses and face shields are required for work with UV light, lasers and other types of radiation, which is absorbed by the eyes and skin (chemical splash goggles are not adequate for these types of work).

3.3 Laboratory Coats, Gloves and Other Protective Clothing

Laboratory coats and shoes should be worn when performing work **(open-toed shoes, sandals, flip-flops, clogs, etc. are prohibited)**. Depending on the type of work, additional personal protective equipment, such as gloves and aprons may be necessary. Coats, aprons and gloves should be removed when leaving the studio or workshop.

Use nonlatex gloves, such as nitrile or vinyl. Gloves should be replaced immediately if they are contaminated or torn. In situations involving extremely hazardous chemicals, double gloves are recommended. Gloves should be carefully selected for their degradation and permeation characteristics to provide proper protection. The thin, vinyl or nitrile gloves, popular for their dexterity are not appropriate for highly toxic chemicals or solvents. See Appendix C for additional information on selecting the proper gloves. More information on specific types and uses of personal protective apparel is also available from EHS.

3.4 Respiratory Protection

The use of air-purifying respirators for routine work is not recommended. Respirators are discouraged because they protect only the wearer and require periodic medical monitoring, specific training and fit testing before they can be worn effectively. Properly operating fume hoods provide the best overall protection from chemical hazards in the studio or workshop. If you choose to wear a respirator, **contact the EHS Manager to arrange for your medical evaluation and training before wearing a respirator.**

Keene State College has a voluntary use policy with respect to respiratory protection. This means there are no known job tasks where Permissible Exposure Limits are exceeded. The respirator is provided for the employee for their comfort. If a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker.

Facemasks are loose-fitting, disposable masks that cover the nose and mouth. These include products labeled as surgical, dental, medical procedure, isolation, and laser masks. Facemasks help stop droplets from being spread by the person wearing them. They also keep splashes or sprays from reaching the mouth and nose of the person

wearing the facemask. **They are not designed to protect you against breathing in very small particles**. Facemasks should be used once and then thrown away in the trash.

A respirator (for example, an N95 or higher filtering face piece respirator) is designed to protect you from breathing in very small particles, which might contain viruses. N95 respirators are most commonly used in construction and other jobs that involve dust and small particles. These types of respirators fit tightly to the face so that most air is inhaled through the filter material. To work most effectively, N95 respirators must be specially fitted for each person who wears one (this is called "fit-testing" and is usually done in a workplace where respirators are used). **All persons who choose to wear respirators or dust masks voluntarily must become familiar with the contents of 20 CFR 1910.134, Appendix D, "Information for Employees Using Respirators When Not Required Under Standard".**

If you choose to wear a respirator, you also need to take certain precautions to be sure that the respirator itself does not present a hazard. If an employee wishes to wear a respirator, he/she must complete the following steps: medical evaluation and instruction on cleaning, maintenance and proper storage of the respirator. If you choose to wear a respirator, the procedures outlined in the **KSC Respiratory Protection Program** (http://www.keene.edu/ehs/Respirator%20Program.pdf) must be followed.

3.5 Protective Clothing Beyond the Laboratory/Studio/Shop

All contaminated, potentially contaminated, or the perception of potentially contaminated protective clothing and equipment (e.g., gloves, safety glasses, lab coats and other personal protective equipment) that is used in the studio that is then brought outside may create a hazard or project a careless image to both colleagues and visitors.

- Wearing gloves outside the studio should be minimized, except to move hazardous materials between laboratories. Instead, transport chemicals from place to place on a cart, in a clean secondary container, or in a bottle carrier with secure handles;
- If there is a need to transport hazardous materials, use a clean, ungloved hand to touch common surfaces and a gloved hand to carry the items: the one-glove rule. Alternatively, package the material so it may be handled without gloves;
- Gloves should never come in contact with door handles, elevator buttons, telephones, lavatory faucets, vending machines, bottled-water dispensers, ice-making machines, or other surfaces outside the studio.

4 VENTILATION

4.1 Ventilation Policy

All work with hazardous materials must be conducted in the appropriate fume hood.

General room ventilation does not provide adequate protection against hazardous gases, vapors and aerosols. All work with corrosive, flammable, odoriferous, toxic or other dangerous materials shall be conducted only in a properly ventilated space. When it is not possible to meet the above requirements, EHS and the Department Chair must evaluate hazards together with the faculty member to determine if work can be conducted safely.

4.2 Fume Hoods

Fume hoods are checked annually (coordinated by EHS). Hoods that do not meet the minimum exhaust requirements during EHS inspections are posted with "DO NOT USE" notes and Physical Plant is notified about the need for repairs. Once repairs have been made, EHS will test the fume hood for proper operation.

Before using the hood, make sure air is entering the hood and the hood is functioning properly. Report any problems to Physical Plant. Do not block baffle openings or place bulky items in the hood that will prevent air from entering the baffle opening.

- Ensure that air is entering the unit.
- Ensure the baffle openings are not blocked and air is flowing properly.
- Conduct work at least six inches from the edge of the hood.
- If the fume hood is equipped with a sash, lower the sash to protect yourself from dangerous reactions.
- Keep hood clean and uncluttered. Wipe up spills immediately.
- Be aware that drafts from open windows, open doors, fans, air conditioners, and high traffic walkways may interfere with normal hood exhaust.
- Always open a chemical bottle under the fume hood so that the fumes inside the bottle will not leak into the room where users will breathe them.
- Always recap chemical bottles immediately after use. Never leave an uncapped bottle under the fume hood. After recapping, immediately restore the bottle to its appropriate storage cabinet.
- Perchloric acid is prohibited at Keene State College, as it can only be used in a special perchloric acid hood which we do not have at KSC. Consult EHS regarding perchloric acid use.

Fume hood alarms indicate substandard operation of fume hoods. They are installed on every new fume hood system and on those which have been upgraded. The fume hood alarm (audio/visual) will indicate an exhaust flow malfunction by an audio and visual alarm. If the fume hood alarm sounds, close the sash and notify Physical Plant. Do not use the fume hood until repairs have been made and EHS has removed the "Do Not Use" sign.

4.3 Spray Paint Booth

There are two spray booths used by graphic arts (one in the drawing room on the third floor of the Redfern Arts Center, and one in the Ceramics Studio). These booths should be used when spraying paints, fixatives and glazes. Be sure the filters are clean, the vents are clear, and the fans are operating when using the spray booths. Report any problems to Physical Plant.

5 EMERGENCIES, SPILLS, & ACCIDENTS

This section contains information on what is considered an emergency, and who should be contacted. In the event that there is a high level of uncertainty on how to categorize a situation, it is recommended to always act conservatively with consideration of human health and safety.

In all emergencies and accidents, the first consideration is your safety and the safety of those around you. **If there is any doubt on what to do,** choose the most protective action and **dial 911 for assistance**.

Emergency Numbers

Fire/Ambulance/Major Chemical Spill: **911**

Campus Safety (first aid, security issues, report of student injury): 358–2228

Clean Harbors Emergency Chemical Spill Response Team (Keene State College's contractor vendor for clean up): 603 224 6626 (day) or 24 hour line – 1-800-OIL-TANK

Environmental Health and Safety: 358-2879 or 209-1362

5.1 Preparation

The first step in any emergency procedure is to be prepared by knowing the hazards of the various materials in each studio/workshop. Review the MSDS's on materials used in the studio, and review with students their responsibilities in the event of a chemical spill or fire. Material safety data sheets should be available to students and visitors who have concerns or questions regarding the hazardous characteristics of the chemicals. For additional resources, see the CEMS web site at https://cems.unh.edu/keene/CEMS/Info.

Chemical containers should be clearly labeled with the contents and any required hazard warnings. Labs should have appropriate signage on the door indicating the predominant hazards in each room and emergency contact information.

5.2 Fire or Explosion

In the event of a fire or explosion[1]:

- Evacuate the fire area. Close the door behind you;
- If someone is on fire, direct the person to 'stop, drop, and roll' and use the blanket to cover the person to snuff out the flames. Seek assistance;
- Notify nearby occupants and pull the nearest fire alarm to activate the building alarm system;
- Proceed in an orderly fashion to the nearest exit (see Appendix D for copies of the evacuation plans for the Redfern Arts Center, the Ceramics Studio, the Sculpture Studio, and the Media Arts Center). Use the stairwells, not the elevator. If there is smoke, stay low to the ground as smoke and heat will rise;
- Gather at the predetermined evacuation point (determined by each department and communicated to students at the start of each semester). Stay away from the building; and,
- Call 358-2228 or 911 and report the location of the fire and any additional information.

[1] Department protocols may require faculty or staff to be trained in the use of a fire extinguisher. There is no requirement to use a fire extinguisher in the event of a fire. However, if you have been trained, if the fire is small (rule of thumb: less than a wastepaper basket) and you feel you can capably use the fire extinguisher, locate the nearest fire extinguisher—pull pin, aim, squeeze and sweep (PASS) for use. Contact Campus Safety at 358-2228 as an additional follow-up and to ensure the fire extinguisher is replaced.

If in doubt, evacuate and call 911.

5.3 Medical Emergency

Serious injuries that require an ambulance should be reported to 911 immediately. Serious injuries include but are not limited to: chest pain, difficulty breathing, unconsciousness, large area of body contacted by a hazardous chemical, broken bone or profuse bleeding.

All other injuries should be reported to Campus Safety at 358-2228 for evaluation of the need for medical assistance. Campus Safety will also document the report and include EHS on the report distribution.

Very minor (first aid) injuries can be addressed via use of first aid kits within the studio.

For any type of injury or "near miss", the instructor should complete an "Incident Report" to determine what happened and what can be done to prevent recurrence. For more information, and to obtain a copy of the Incident Report Form see Appendix E or go to: http://www.keene.edu/ehs/accident.cfm.

5.4 Chemical Spills

5.4.1 Minor Chemical Spill

A minor chemical spill is considered one that staff or faculty are capable of handling safely without assistance and where there is no injury or threat of imminent injury. Typically, a minor spill would be considered less than 0.5 liter (as a rule of thumb) of a material that is not highly toxic. Spill kits are available in each workshop or studio where chemical materials are used and should only be used by those qualified staff or faculty with knowledge of the properties and hazards posed by the chemical, and any potential dangers posed by the location of the spill. Spill cleanup materials should be segregated for hazardous waste disposal. EHS should be contacted for advice and assistance at 358 2879.

The basic procedure is as follows:

- Only qualified persons knowledgeable of the material(s) spilled should perform the cleanup;
- Alert all persons nearby spill area;
- Use eyewash or safety shower if needed to decontaminate;
- Use spill kit to clean up and segregate clean up materials for hazardous waste disposal. Use proper personal protective equipment, which at a minimum will include chemical resistant gloves and safety glasses;
- Decontaminate spill area with water or soap/water mixture if a non-reactive chemical;
- Wash hands thoroughly and seek medical attention if necessary (see Section 6 regarding medical employee monitoring and record-keeping); and,
- Notify EHS 358-2879, complete the Spill Report Form (Appendix E) and return it to EHS (mailstop 2502).

5.4.2 Major Chemical Spills

All other spills not described above are considered major spills. Keene State College does not have an on-site emergency response team; therefore, our primary response is to evacuate, call 358 –2228 or 911, and protect human health.

The basic procedure is as follows:

- Avoid breathing vapors of spilled material;
- If possible and safe to do so, turn off any ignition source or gas emergency shutoff valve;
- Remove any contaminated persons from spill area and decontaminate via eyewash or safety shower. The use of a safety shower is never a mistake – do not be reluctant to use the shower in the event of personal chemical contamination;
- Evacuate the area and close the door to the lab;

- Post a sign stating “Hazard – Do Not Enter” on the exterior surface of the door once all personnel are evacuated, if safe to do so;
- Call 358 –2228 or 911 and notify the operator of the location, nature and volume of the spill;
- Contact Campus Safety to initiate internal notifications, including EHS. EHS/Campus Safety or Keene Fire Department should be directed to contact Clean Harbors for spill clean up and disposal;
- If there is a threat to human health or the environment or when there can be off-site impact, any incident involving hazardous waste or material must be reported immediately to the NHDES (603-271-3899 or 603-223-4381), and the NRC (800-424-8802). A courtesy call should also be made to the Environmental Protection Agency (EPA) Region I Spill Response (617-918-1279); and,
- If a spill discharges to the sanitary sewer, the spill must be reported immediately to the Keene Industrial Pretreatment Coordinator (357-9836, ext.6504) or Mutual Aid (911) if after hours.
- Notify EHS 358-2879, complete the Spill Report Form (Appendix E) and return it to EHS (mailstop 2502).

5.5 Blood (From Injury)

Use the following Personal Protective Equipment (PPE) to protect against human blood:

Gloves	Worn for touching blood and body fluids requiring universal precautions, mucous membranes or non-intact skin of all patients and for handling items or surfaces soiled with blood or body fluids to which universal precautions apply.
Masks, eye protection, face shields	Worn to prevent exposure of mucous membranes of the mouth, nose and eyes during procedures that are likely to generate droplets of blood or body fluids requiring universal precautions.
Lab coats, gowns, aprons	Worn during procedures that are likely to generate splashes of blood or body fluids requiring universal precautions.

- Wearing household gloves, face protection, and a lab coat, absorb blood with paper towels;
- Using a detergent solution, clean the spill site of all visible blood;
- Wipe down the spill site with paper towels soaked in a disinfectant such as chlorine bleach, diluted 1:10;
- Double-bag all contaminated materials in plastic bags or container and discard in trash. If the materials are completely saturated notify EHS for proper disposal procedures; and,
- Wash your hands with soap or hand washing disinfectant.

6 General Chemical Handling and Hazardous Waste Management

6.1 Chemical Procurement and Distribution

- Plan projects with safety in mind. Substitute less hazardous chemicals in procedures when possible.
- Only purchase what you can reasonably expect to use during the next six (6) months;
- ***Less is Better --*** Purchase containers in the smallest practical size. Although the per unit cost may be greater significant savings are realized in reduced disposal costs and safer storage;
- When possible, buy what you specifically need;
- Glass breaks. When available, purchase chemicals in plastic containers. If this is not possible, purchase shatter resistant plastic coated bottles;
- Read labels. Most of what you will need to know on how to handle and store the chemical is found on the manufacturers' label or in the Material Safety Data Sheet (MSDS), which can be found on the CEMS website at https://cems.unh.edu/keene/CEMS/Info or through a chemical vendor;
- **Indicate the date received and the date opened on the container. Pay particular attention to expiration dates** – especially peroxide-forming compounds;
- Keep your chemical inventory and your emergency signs updated at https://cems.unh.edu/keene/CEMS/Info;
- Before opening a package containing hazardous substances, inspect the packaging carefully for any signs of breakage or leakage of material. If there are any signs of leakage, place package in a fume hood, protect from exposure and call EHS for assistance; and,
- After removing chemicals from the packing material carefully compare the number and identity of items against the packing slip before disposing of the packing materials.

Please contact EHS for assistance in storing, using or disposing of chemicals. Detailed procedures regarding general chemical safety are also provided in the KSC "*Chemical and Biological Safety for the Sciences and Social Sciences*" (http://www.keene.edu/ehs/Chem_Biol_Safety_Plan_2009.pdf).

6.2 Hazardous Waste Management

The inappropriate disposal of potentially hazardous chemicals is illegal and can have serious repercussions. The Keene State College **Hazardous Waste Disposal Procedures** provides specific instructions for proper disposal of both hazardous and nonhazardous waste streams (acids/bases, chemicals, biological wastes, sharps, etc.). Under no circumstances should hazardous wastes be discharged into the environment in an effort to "save money", as a matter of "convenience", or due to carelessness in planning preparation, operations or design. Assistance in preventing or resolving such issues is always available from Environmental Health and Safety.

Please remember to label all of your containers regardless of size. Labeling of stock solutions is essential. All labels must include the commonly accepted name (NO CHEMICAL FORMULAS), special warnings, individual responsible and the date made. When you plan to leave the college, contact EHS to help you clean out the laboratory so that unknowns can be identified.

If you suspect or have knowledge of the inappropriate disposal of potentially hazardous materials or deviations from the following guidance, you should immediately report these concerns to the Environmental Health and Safety Manager. No employee of Keene State College shall be discriminated against or be subject to any reprisal for reporting suspected violations of the College's policies on the disposal of potentially hazardous materials. Anyone who handles chemicals should:

- Attend training when required;
- Refer to the *Hazardous Waste Procedures* and/or the *Chemical and Biological Safety Plan for the Sciences and Social Sciences* when questions arise regarding chemical safety or hazardous waste. **Help is always available from EHS;**
- Never store more than 10 gallons of hazardous waste in your lab or studio;
- Properly label all stock containers and hazardous waste containers;

- Keep waste containers closed except when adding waste;
- Never mix incompatible wastes;
- Use sturdy, chemically resistant containers to store your wastes;
- Segregate incompatible chemicals at all times—including incompatible wastes—Never store flammables with oxidizers or acids with caustics;
- Use secondary containment bins for all hazardous liquids and liquid wastes;
- DO NOT dispose of hazardous wastes by evaporation, sewer or in the regular trash. **Evaporation is not an acceptable waste disposal method.** Only insignificant, residual amounts of liquid associated with lab ware or containers can be treated in this way;
- Notify EHS at 358-2879 in the event of a significant exposure or spill. -- Hazardous waste spills may activate the Keene State College Integrated Contingency Plan. See Section 5 for the abbreviated version of the Plan; and,
- **Reduce, Reuse, Recycle**!

7 STUDIO ARTS/GRAPHIC ARTS

7.1 General

The most important thing you can do to work safely is to think through your project before you begin to work and ask yourself the following questions:

1. What types of materials and equipment will I be working with?
2. What are the possible hazards—will I be using chemicals (including paints), sharp tools, or mechanical equipment that could cause injury or fires?
3. Do I understand these hazards and do I know how to use the equipment?
4. Have I read all of the instructions?
5. Do I have permission from the instructor to use the equipment?
6. Do I have the proper personal protective equipment (safety glasses, goggles, clothing, shoes, etc.)?
7. If something goes wrong, do I know where the emergency equipment is located (fire extinguisher, eyewash station, emergency shower, fire alarm pull station)?
8. What will I do if something goes wrong or I am injured? How can I get help, and is there someone close by who can help me?

If you have trouble answering any of these questions be sure to ask for help before you begin. Here are some basic general rules that apply to all studios and shops where chemicals are used or where there may be other physical or mechanical hazards.

7.1.1 Rules for Working with Chemicals (paints, solvents, glues, acids, etc.)

- No eating or drinking. Wash your hands thoroughly when you finish working or leave the studio to remove the contaminants from your hands—good personal hygiene is one of the most important ways you can reduce your exposure.
- Avoid eye and skin contact. Never wash your hands in a solvent and wear gloves if your hands have cuts or are chaffed—chemicals can pass through these breaks in the skin and enter directly into your blood stream. Apply skin moisturizers regularly to keep your skin from drying out.
- Wear older non-synthetic clothes or a full length smock or coveralls while working in the studio. Wash them frequently and separately from other clothing. If toxic materials are being used, wear disposable coveralls and remove and properly dispose of them in the studio.
- Wear chemical protective gloves, apron, and eye protection (goggles) as necessary when handling solvents and corrosive chemicals, or when cleaning brushes, screens, and other equipment.
- Use solvents sparingly--use water-based products instead of solvent-based ones when possible.
- Keep all chemical containers closed when they are not in use.
- Wear comfortable, sturdy shoes. NO high heels, sandals, open-toed shoes, roller blades, or bare feet will be allowed. Long hair should be tied back.
- Apply aerosol paints, fixatives, and adhesives in a spray booth or well-ventilated area.

7.1.2 Rules for Woodworking and Machine Shops, Sculpture Studio

- Shop supervisors may prohibit shop access or machinery use for any reason.
- Do not attempt to use any tool or machine before being fully trained in its use by your faculty. It is your responsibility to ask for assistance if you are unsure how to safely use a tool, machine, or equipment.
- NEVER WORK ALONE.
- DRUGS AND ALCOHOL (or being under the influence of drugs/alcohol) ARE STRICTLY FORBIDDEN!
- Shop supervisor MUST be present when power machines are in use.

- ALWAYS WEAR SAFETY GLASSES when using chemicals or performing operations that could create flying projectiles (some operations require additional protective equipment).
- No loose clothing (ties, scarves, loose sleeves) may be worn in the shop or studio.
- No open-toed shoes or short pants allowed in the shop.
- Remove all jewelry before beginning work, including rings, necklaces, bracelets, and watches.
- LONG HAIR must be contained and pulled back tightly in a bun. Long beards must also be contained.
- Understand your operation before you begin or ask your supervisor for help.
- DO NOT USE DAMAGED EQUIPMENT or equipment that does not appear to be operating normally--report condition to shop supervisor.
- When using a hand-carving tool or X-Acto knife[2], keep your hands behind the tool and cut away from your body.
- Beware of hot glue guns—they can cause serious burns.
- All guards and shields must be secured in place prior to operating equipment. Remove adjusting keys and wrenches before turning on tool or machine.
- Always check wood for screws or other embedded metal objects.
- Clear dust and debris before and after machine use. Keep floor around tool or machine work area free from scraps and debris
- KEEP AISLES, EXITS AND ACCESS TO EMERGENCY EQUIPMENT CLEAR.
- Never talk to or touch the machine operator.
- No cell phone use.
- DON'T WORK IF YOU ARE TIRED! Take frequent breaks to stay alert.
- Portable music players may not be used; store them at the entrance to the shop prior to working—no loud music.
- Food and drinks are permitted in designated areas only.
- Compressed air used for cleaning equipment must not be greater than 30 psi pressure. Do not use compressed air to clean skin or clothing.
- Immediately report all problems or concerns to your instructor or the shop supervisor.
- Use the right tool. Don't force a tool or machine to do a job for which it was not designed.
- Allow the tool or machine to come to a complete stop before attempting any adjustments. Disconnect power when servicing, changing blades, bits and cutters.
- Any tool or machine found to be out of order or malfunctioning in any way should be immediately reported to the Technical Director.
- Know the location of the nearest fire extinguisher and learn how to use it[3].

Stationary Power Tools

- Do not use any machine unless you have been trained and approved by your faculty or supervisor.
- Do not operate a machine without its safety guards in place and in good working order.
- Think through all operations carefully before turning on the machine. Think twice, measure twice, cut once.
- Before the power is turned on, remove all tools, wood scraps, or other materials from the machine table. Vibration from the machine might cause these items to move into the path of a moving part.

[2] See Section 2.4.7 for proper disposal of used blades and other sharps.

[3] There is no requirement to use a fire extinguisher in the event of a fire. However, if you have been trained, if the fire is small (rule of thumb: less than a wastepaper basket) and you feel you can capably use the fire extinguisher, locate the nearest fire extinguisher—pull pin, aim, squeeze and sweep (PASS) for use. Contact Campus Safety at 358-2228 as an additional follow-up and to ensure the fire extinguisher is replaced.

- Check the setup of the machine carefully for each job before turning on the machine.
- Never leave a machine unattended while it is still running.
- Do not overreach. Keep proper footing and balance at all times.
- Obtain help when handling long or broad pieces of wood or other materials.
- Make sure that spectators do not stand directly in line with revolving cutters or material.
- While a machine is running, be alert to noises that might mean it is not operating properly. If it does not sound right, shut it off and get help from the technical director.
- Once a machine has been turned off, do not use a stick or your hands to slow down or stop moving parts.

Portable Power Tools

- Use only a tool that can handle the job adequately.
- Before starting a motor, always check to see that the tool is in safe operating condition and that there are no loose parts.
- When a power tool is not in use, disconnect it at the outlet. It is not completely safe to trust tool switches. When you disconnect the tool from the outlet, do not pull the plug from the receptacle by yanking on the power cord.
- Hold tool firmly with both hands. Use a vise or clamp to hold work whenever possible.
- Do not activate a tool while carrying it at your side.
- Always make sure that the power cord is out of the way of the saw blade and that it is in good condition.

7.2 Drawing Materials and Pastels

Drawing materials include pencils, conte crayons, charcoal sticks, oil and dry pastels, and more. They can contain the same toxic pigments that are in artists' paints. Drawing materials, especially the soft pastels, can produce significant amounts of dust containing exceedingly small particles of pigments and carriers. This dust can be inhaled and will settle all over surfaces, clothing, shoes, and hair.

- Use pencils, conte crayons, chalk and charcoal whose particles are larger and easier to control with good clean-up and ventilation.
- Use oil/wax pastels, rather than dry pastels, which eliminate the dust hazard and only require good hygiene to be used safely.
- If soft, dry pastels are used, work in a studio separate from your home, wear a respirator or provide special ventilation, leave work clothing and shoes in the studio, clean with a HEPA vacuum.
- Avoid pastels colored with highly toxic pigments, such as those containing cadmium, chromium or cobalt.
- Spray fixative in a spray booth or according to the manufacturer's recommendations for use and handling.

7.3 Paint/Printmaking

The hazards of painting and printmaking are primarily related to the paints, inks, solvents, and corrosive materials associated with these activities. Carefully review the MSDS for the products you will be using in the studio and identify the hazardous components in each product. Be sure to follow the appropriate precautions when using these materials and instruct your students in the safe handling of these materials. Wherever possible, substitute less toxic materials for powdered pigments that contain lead, cadmium, or mercury.

7.3.1 Solvents

The following table lists some of the frequently used solvents and associated risks:

Solvent	Hazard	Symptoms
Mineral Spirits (paint thinner, lithotine, turpentine, lacquer thinner and spray paint)	Central nervous system depressant	• dizziness • headaches • nausea

Solvent	Hazard	Symptoms
	Long term exposure	• possible damage to liver, kidneys, bladder, central nervous system
	Skin irritant	• defatting agent • dermatitis • dry skin • general skin irritation
Liquid etching ground and asphaltum (contains naphtha which is similar to mineral spirits	Central nervous system depressant	• dizziness • headaches • nausea
	Long term exposure	• possible damage to liver, kidneys, bladder, central nervous system
	Direct contact	• skin irritant (dermatitis) • possible carcinogen (skin cancer)—Asphaltum)
Alcohol – solvent alcohol – denatured alcohol	Central nervous system depressant	• dizziness, • headaches • nausea
	Systemic Effects	• particularly susceptible to absorption • liver damage • central nervous system • blindness (methanol and denatured alcohol)

- If possible, use tube or pre-mixed paints and commercially available inks to avoid mixing your own. If you mix your own pigments, do it in a ventilation hood.
- Use solvents sparingly--use water-based products instead of solvent-based ones when possible.
- Keep all chemical containers closed when they are not in use and make sure that they are properly labeled.
- Never use your lips to point the end of your paintbrush or hold your brush handle with your teeth.
- If you are apply a pint (or more) of a product that contains a flammable solvent, remove all sources of ignition from the area.
- Store flammable materials in a flammable-storage cabinet.
- Dispose of all solvent soaked rags in the self-closing oily waste cans (these are emptied weekly). Solvent-soaked paper must be placed in the 55 gallon drum located in the Print-making room.
- Do NOT FLUSH SOLVENTS DOWN THE SINK DRAINS—used solvents should be poured into the RED recycling solvent containers.
- Clean up minor spills immediately with paper towels or absorbent pads.
- Use ventilation equipment—open windows (weather permitting). Please shut all windows when finished.
- Take frequent breaks outside of the work area.
- Perform spray applications in a paint-spray booth or other locally exhausted hood. Choose brushing techniques rather than spray applications if possible.
- Avoid exposure to solvents during clean up by using disposable screens, brushes, and other equipment. Clean up small spills immediately.

7.3.2 Acids

Frequently used acids include:

Acid	Hazard	Symptom
Nitric acid	Contact hazard	Severe burns to skin and eyes
	Vapor inhalation	• May damage mucous membranes • Damage to lungs and upper respiratory tract • Lung damage may result in Plumonary Edeme or Emphysema • Damage to dental enamel
Phosphoric acid (lithography)	Contact hazard	• Burns to skin and eyes
	Inhalation hazard	• Irritates mucous membranes
Hydrochloric acid	Contact hazard	• Burns to skin and eyes

Acid	Hazard	Symptom
(etching and lithography)	Inhalation hazard (particularly Dutch Mordant which emits chlorine gas)	• Similar to nitric acid—highly irritating to mucous membranes
Tannic acid (lithography	Ingestion	• May cause liver damage • Suspected carcinogen to the liver
Acetic acid (lithography)	Contact hazard	• Burns eyes and skin (concentrated acid)
	Inhalation hazard	• Highly irritation to mucous membranes • Strong, pungent odor

- Avoid eye and skin contact.
- WEAR SAFETY GOGGLES – chemical splash type.
- Wear glasses instead of contact lens, especially in etching studios to avoid acid vapors getting under contact lenses.
- ALWAYS WEAR THE BLACK PROTECTIVE GLOVES.
- Wear a rubberized apron.
- Use the ventilation equipment.
- Place plates into the acid carefully -- avoid splashing.
- Always rinse hands and gloves with plenty of water after working with acids. DO NOT TOUCH EYES OR FACE until gloves are removed and hands are completely rinsed and dried.
- Rinse plates thoroughly with water after removal from acid.
- When mixing acid baths – always ADD ACID TO THE WATER – water first, acid second.
- All minor spills should be cleaned immediately with water and absorbed with paper towels.
- Acid baths should be kept covered when not in use.
- When moving heavy items such as litho stones, use appropriate lifting techniques, get help from another person, or use mechanical aids.

7.3.3 Printmaking—Press Safety

- Keep hands away from the steel rollers
- Operate wheels and cranks slowly and methodically
- DO NOT SPIN THE WHEELS
- Do not stand on the wheels
- Do not place arms or hands through the spokes of the wheel when it is being operated.
- Keep hands away from the press bed and guide wheels while operating the press.
- Never pull the litho press beds back to inking position after printing – the crank will spin rapidly and could result in personal injury. Crank the bed back into position.
- Always use a strong template or chase to secure woodblocks for printing on the etching presses. DO NOT HOLD THE BLOCK WITH YOUR FINGERS – SERIOUS PERSONAL INJURY MAY RESULT IF YOUR FINGERS GET CAUGHT BETWEEN THE BLOCK AND THE ROLLER.
- Always use the lift truck to safely move lithographic stones to the press

7.3.4 Printmaking—Squaring Shear-Plate Cutter

- Keep hands and fingers away from the guard, clamp and blade. Serious crushing or amputation may occur.
- Do not place feet below the treadle. The treadle may crush your foot while cutting a plate
- Do not jump on the treadle – if you are having difficulty operating the shear, ask for assistance

7.4 Ceramics

Ceramics includes three main activities: preparing and molding the clay, glazing, and firing the clay. Clay contains crystalline silica, which if inhaled over many years can lead to silicosis. Loading and mixing dry clay in a clay mixer creates the most likely opportunity for exposure to the silica-containing dust. Talc added to clay may contain asbestos or "asbestos-like" fibers that can also result in debilitating and sometimes fatal asbestos-related diseases. Glazes are mixtures of silica, alumina, and metal fluxes which may contain toxic metals such as lead, cadmium, chromium, uranium, and arsenic). Frits are created by melting various glaze ingredients into a glass and grinding them into a powder, and may also contain heavy metals.

During the firing process, clay releases combustion products and gases whether using a fuel-fired or electric kiln. The emissions include carbon monoxide, formaldehyde, sulfur oxides, chlorine, fluorine, metal fumes, and nitrogen oxides. Unless ventilation is excellent, metal fume particles such as lead and cadmium can settle and contaminate other ware and surfaces. In addition, fuel-fired kilns release the products of combustion from their fuel sources. Infrared radiation emanates from hot (glowing) fired ceramics and can cause cataracts after long periods of exposure. Unloading hot objects from a kiln can cause burns.

- If possible, avoid exposure to clay dust by purchasing pre-mixed clay. If you mix your own clay, the mixer should have local exhaust ventilation and be equipped with appropriate machine guards to prevent access to moving parts while operating.
- When lifting heavy items such as bags of clay, clay additives, or glazing compounds, use appropriate lifting techniques, get help from another person, or use mechanical aids.
- Raise your potter's wheel so you can work in an upright position.
- Use asbestos-free talcs.
- Regularly wet mop, hose down, or vacuum (with a HEPA vacuum) the studio, particularly the dry mixing area, to remove silica dust and heavy metals. Do not allow spilled clay to dry—it can be crumbled into an airborne dust.
- Purchase prepared glazes without toxic heavy metals (lead, cadmium, arsenic, uranium) whenever possible.
- If you mix your own glazes, wear gloves. Mix glazes under the local exhaust ventilation.
- Avoid spraying techniques that will aerosolize the glazes—use a brush or drip glaze on your clay. If you must used spraying techniques, use the paint spray booth.
- All kilns must be locally exhausted and vented to the outside. Keep combustible materials, particularly flammable materials, away from kilns. Small kilns should be raised at least a foot off the floor with refractory bricks placed underneath. Keep a fire extinguisher close by and know how to use it.
- Wear appropriate shaded eye protection when looking directly into the kiln.

Note: If you are creating ceramics that will come into contact with food or drink, select a food-safe glaze that is periodically tested by a laboratory. Some glazes contain heavy metals such as lead and cadmium that can leach from glazed items after they have been fired. Using prepared glazes labeled "food safe" will not assure a safe product because small variations in application and firing can alter leaching characteristics. Most glazes leach their metals faster when exposed to acid solutions such as orange juice.

7.5 Sculpture

The hazards associated with sculpture relate to the materials used and the techniques used to shape the medium. Materials include a variety of soft and hard stones, cement, plaster, self-hardening clays, and plasticine. A wide variety of resins (acrylic, phenolic, epoxy, polyester silicone, and polyurethane) used to form plastic sculpture contain volatile components that may reach high concentrations if used in large volume or if the work area is poorly ventilated. Two-component urethane resin systems release extremely toxic isocyanates and must only be used with a supplied air hood. Some of the additives in plasticine clays such as turpentine and preservatives might cause skin irritation or allergies, and sulfur dioxide might cause some respiratory problems in certain asthmatics. The amounts present are usually small. (*ART HARDWARE: The Definitive Guide to Artists' Materials,* by Steven Saitzyk © 1987 http://www.trueart.info/sculpture.htm). Carefully review the MSDS for the products you plan to use or the media with which you will work and identify the hazardous components that may be in these materials.

Possible physical hazards include flying chips of rock that can injure eyes and dust that can be inhaled. Electric shaping tools may create high levels of noise and vibration. Hand tools used in carving can cause cuts and bruises if they are used improperly. Plaster and cement dust can be very irritating to the skin, eyes, and respiratory system.

Overheating wax can result in release of decomposition products that are highly irritating, and overheating wax containing water may lead to an explosion.

- Wear goggles to protect your eyes against flying debris and chemical splashes.
- Wear steel-toed shoes to protect your feet.
- Equip your tools with point-of-operation local exhaust ventilation. Wet mop the studio or vacuum with a HEPA-filtered vacuum. Never dry sweep.
- Apply a fine water spray over your sculpture to reduce the generation of dust.
- Keep your hands behind the tool and cut away from your body when using a hand-carving tool.
- When lifting heavy items such as stones or plaster, use appropriate lifting techniques, get help from another person, and/or use mechanical aids.
- Do not overheat wax—use a temperature-controlled crock pot or a double boiler.
- Make sure all electrical tools are double insulated, properly grounded, and connected to a ground fault circuit interrupter (GFCI).
- Wear earplugs or muffs when using noisy tools. If possible, enclose noisy equipment such as pneumatic compressors or move them away as far as possible.
- Wear gloves and goggles as necessary to protect your hands and eyes from contact with irritating substances in plaster and cement.
- Use ventilation to control exposures to dust and hazardous materials.
- Wear chemical protective gloves, apron, and goggles when handling bulk quantities of resins.
- If you are using a pint or more of a product that contains a flammable solvent, remove all sources of ignition from the area.
- Store flammable materials in a flammable-storage cabinet.

7.6 Woodworking

Woodworking hazards include the wood itself, preservatives that may be present within the wood, hand and machine tools used to shape it, glues used to fasten pieces together, and finishing compounds that provide a surface coat. Carefully review the MSDS for the products you plan to use or the media with which you will work and identify the hazardous components that may be in these materials. Teach your students how to protect themselves by reviewing the information in the MSDS.

Dusts from many hardwoods are sensitizers, and both hardwoods and softwoods can cause allergic reactions of the eyes, skin, and respiratory system. Wood dust from ebony, rosewood, blackwood, sequoia, and redwood can also be toxic, and may cause a type of nasal carcinoma after an extended exposure and long latency period. Softwoods are generally considered safer to work with. Many of the preservatives (such as pentachlorophenol, chromated copper arsenate, zinc, and copper naphthenate) used to treat wood are also quite toxic. Exposures can occur from sawing wood or from handling the wood with bare hands. Fine sawdust suspended in the air in an enclosed environment can explode if it comes in contact with an ignition source.

Machines used to shape or cut wood are noisy and can lead to hearing loss. Severe accidents can occur if hands or other body parts come in contact with unguarded moving parts, cutting surfaces are dull, or equipment is used improperly. Extended use of vibrating hand tools can cause repetitive stress injuries, and improperly grounded electrical tools may cause electric shock. Pneumatic nail guns and staple guns can cause serious injuries to eyes, hands and fingers by causing splinter or blow out fragments from the material, puncturing the back of the material, firing completely through the material and striking workers behind the nailing surface.

Some of the glues, adhesives, paints and other solvent based finishes are moderately toxic and may cause skin and respiratory irritation. Many of these solvents are flammable, and oil rags can spontaneously combust.

- If possible, use less-toxic softwoods instead of rare tropical hardwoods or more highly toxic hardwoods, particularly if you have a history of allergies.

- All floor-mounted woodworking equipment should be fitted with local exhaust ventilation at the point of operation and filtered. If possible, select hand tools that have attached dust collectors.
- If your hands have cuts or are chaffed wear gloves.
- Wear respiratory protection[4] when working with exotic hardwoods or when using equipment that is not locally exhausted.
- Wear hearing protection such as earplugs or muffs when using noisy hand tools or machines.
- Wear safety goggles when working with equipment that generates dust or chips.
- Make sure all equipment is equipped with guards, and consider installing panic buttons for shutting off equipment in an emergency.
- Only use equipment on which a qualified instructor has given you a safety and operation orientation.
- When purchasing new equipment, consider upgrading to a tool with greater safety features such as the "Sawstop" table saw and contractor saw.
- Wear gloves and use proper ventilation when cutting and handling wood with preservative. Wash thoroughly when finished and before eating, drinking, or smoking.
- Never burn wood treated with preservative.
- When using hand-carving tools, keep your hands behind the tool and cut away from your body.
- Keep all cutting tools sharp.
- Vacuum up wood dust regularly.
- Substitute the more toxic glues with safer "white glue" (polyvinyl acetate) whenever possible.
- Wear a light pair of gloves when handling epoxy, cyanoacrylate, formaldehyde-resin glues, or contact adhesives. Wear chemical protective gloves and goggles when handling solvents or cleaning brushes.
- If you are using a pint or more of a product that contains a flammable solvent, remove all sources of ignition from the area.
- Store flammable materials in a flammable-storage cabinet.
- Dispose of all solvent soaked rags in the self-closing oily waste cans (these are emptied weekly).
- Know the location of the nearest fire extinguisher and how to use it[5].
- Do not eat, drink, or smoke in the woodshop. Wash your hands thoroughly with soap and water when you finish working or leave the shop. Good personal hygiene is one of the best ways to reduce your exposure to hazardous materials. Apply moisturizers regularly to prevent your skin from drying out.
- Never wash your hands in a solvent.

7.7 Photography

The hazards associated with photography relate to the chemicals used in the photographic process, some of which can cause severe skin and respiratory reactions in sensitized individuals. Choose products that contain less toxic compounds when possible. Carefully review the Material Safety Data Sheets (MSDS) for the products that you plan to use and identify the hazardous materials that these products may contain.

- Wear gloves, chemical splash goggles, and an apron when mixing working solutions and pouring them into trays or other equipment. If toxic volatile compounds are involved, do so under local exhaust ventilation. Use premixed chemicals instead of dry chemicals if possible.
- Substitute less-toxic alternatives for developers, toners, and bleaches. Consult the product's MSDS.

[4] See Section 3.5 for detailed information about respiratory protection.

[5] There is no requirement to use a fire extinguisher in the event of a fire. However, if you have been trained, if the fire is small (rule of thumb: less than a wastepaper basket) and you feel you can capably use the fire extinguisher, locate the nearest fire extinguisher—pull pin, aim, squeeze and sweep (PASS) for use. Contact Campus Safety at 358-2228 as an additional follow-up and to ensure the fire extinguisher is replaced.

- Never put your bare hands in working solutions (particularly developer solution, which may contain a strong sensitizer). Use tongs instead. If you come in contact with any solutions, wash the affected area immediately with soap (an acidic cleanser such as pHisoderm) and water.
- When finished working or when leaving the darkroom wash your hands thoroughly.
- Never eat, drink, or smoke in the darkroom.
- Store concentrated photo-chemicals (particularly stop baths) on low shelves where they will not spill and splash your face or eyes. Store photo-chemicals in original or polypropylene containers—never glass.
- Always turn on ventilation when working with chemicals.
- Cover working solutions when not in use.
- Learn where the eyewash station and safety shower are located and know how to operate them.
- Clean up spills immediately. Keep the work area clean and uncluttered.
- Never mix stop bath solutions directly with fixer, toner, or any bleaching solutions to prevent the release of toxic gases.
- To the degree possible, separate electrical equipment from water sources and install ground fault circuit interrupters.

7.8 Metalworking

Hazards associated with metalworking depend on the type of work performed and methods used. Artists may weld, braze, or solder metals as well as cast or forge them. Carefully review the MSDS for the products you use and the hazardous materials they may contain. Before students used metal working equipment, be sure to have a qualified instructor provide a safety and operational orientation for them.

The welding process generates a number of toxic air contaminants, including metal fume. High energy arc welding can create oxides of nitrogen, ozone, and highly irritating acidic gases. If metals being welded are coated with heavy metals such as lead paint, zinc, chrome, cadmium etc., these metals will become vaporized and could be highly toxic if inhaled. Cobalt, chromium, cadmium, nickel, and beryllium are carcinogenic and cause brain damage. Ultraviolet light emitted from are welding can transform chlorinated hydrocarbons into phosgene gas. Oxyacetylene torches produce carbon monoxide. Physical hazards associated with welding include electric shock (arc welding), burns, fires, and exposure to infrared and ultraviolet radiation. Lead and zinc are sometimes found in brazing rods, and fluoride and lead are common hazards associated with soldering.

- Avoid using metals that contain lead, zinc, nickel, and other toxic metals.
- Wear appropriately shielded goggles, a helmet and/or face shield (depending on the work you are doing), coveralls, apron, insulated gloves, and shoe coverings when working around hot metal and furnaces. Wear earplugs or muffs while metalworking.
- Keep a fire extinguisher close by and know how to use it[6].
- Before using welding equipment, carefully review the manufacturer's operation and safety procedures for all electrical equipment, compressed gas cylinders, regulators, and torches. After reviewing this information, obtain additional instruction and assistance in using the equipment from a qualified instructor. Follow all operational and safety instructions for your equipment.
- Report any damaged welding equipment to your instructor immediately.
- Use local exhaust ventilation to collect air contaminants generated while welding.
- Never store or use chlorinated hydrocarbons or flammable or combustible materials in the same area in which you are welding, particularly arc welding. Use a welding curtain to shield your work from others.

[6] There is no requirement to use a fire extinguisher in the event of a fire. However, if you have been trained, if the fire is small (rule of thumb: less than a wastepaper basket) and you feel you can capably use the fire extinguisher, locate the nearest fire extinguisher—pull pin, aim, squeeze and sweep (PASS) for use. Contact Campus Safety at 358-2228 as an additional follow-up and to ensure the fire extinguisher is replaced.

- Do not eat, drink, or smoke in the studio. When finished working or leaving the studio wash your hands thoroughly. Good personal hygiene is one of the most important ways you can reduce your exposure.
- Wear appropriate studio clothing (old non-synthetic clothing and closed-toed shoes). Wash them frequently and separately from other clothing.

7.9 Graphic Design/Model Making/Mold Making

The major hazards associated with model making are the inhalation of dusts, fumes and mists when fabricating models, architectural plan drawing using solvent based inks and markers, adhesive bonding, and surface finishing. Markers, glues, spray paints and adhesives all have the potential to produce hazardous vapors that can cause nerve damage and respiratory irritation. Good ventilation while using these types of products is very important, especially when your work requires prolonged periods of exposure. Any sprayed-on surface coating should be performed in a spray booth with an adequate exhaust system.

Some molds contain formaldehyde resins, which are strong lung irritants and are possible carcinogens. Always provide for adequate ventilation and wear respiratory protection if warranted by the material being used[7].

Avoid contact with glue or filler, including rubber cement. Extreme care needs to be taken in the use and handling of these materials as they can cause respiratory irritation and are flammable.

- ALWAYS READ THE INSTRUCTIONS ON THE CONTAINER!
- When using a hand-carving tool or X-Acto knife[8], keep your hands behind the tool and cut away from your body.
- Beware of hot glue guns—they can cause serious burns.
- Eliminate the use of turpentine and turpentine-based products.
- Avoid pressure treated wood.
- Minimize the use of oil-based resins or spray paints, used water-based paints for coloring models.
- Ensure proper ventilation and wear protective clothing (gloves, safety glasses, etc.).
- Use water or alcohol-based markers rather than those containing toxic and flammable solvents.
- Use non-aerosol spray paints and adhesive.
- Use soap and water (not solvents) to wash hands.
- Choose rubber cement that contains heptanes instead of hexane.

[7] See Section 3.5 for detailed information about respiratory protection.
[8] See Section 2.4.7 for proper disposal of used blades and other sharps.

8 THEATER

8.1 General

There are a number of hazards associated with film, tv, and theater, especially slip, trip, and falls, lifting, fire safety, and mechanical and chemical exposures associated with building sets, costumes, and makeup.

The most important thing you can do to work safely is to think through your project before you begin to work and ask yourself the following questions:

- What types of materials and equipment will I be working with?
- What are the possible hazards—will I be using chemicals (including paints), sharp tools, or mechanical equipment that could cause injury or fires?
- Do I understand these hazards and do I know how to use the equipment?
- Have I read all of the instructions?
- Do I have permission from the instructor to use the equipment?
- Do I have the proper personal protective equipment (safety glasses, goggles, clothing, shoes, etc.)?
- If something goes wrong, do I know where the emergency equipment is located (fire extinguisher, eyewash station, emergency shower, fire alarm pull station)?
- What will I do if something goes wrong or I am injured? How can I get help, and is there someone close by who can help me?

8.2 Theater Set Shop

8.2.1 Rules for working with chemicals (paints, solvents, glues, acids, etc.)

- No eating or drinking--Wash your hands thoroughly when you finish working or leave the shop, to remove the contaminants from your hands—good personal hygiene is one of the most important ways you can reduce your exposure.
- Avoid eye and skin contact--never wash your hands in a solvent and wear gloves if your hands have cuts or are chaffed—chemicals can pass through these breaks in the skin and enter directly into your blood stream. Apply skin moisturizers regularly to keep your skin from drying out.
- Wear older non-synthetic clothes or a full length smock or coveralls while working in the set shop. Wash them frequently and separately from other clothing.
- Wear chemical protective gloves, apron, and eye protection (goggles) as necessary when handling solvents and corrosive chemicals, or when cleaning brushes, screens, and other equipment.
- Use solvents sparingly--use water-based products instead of solvent-based ones when possible.
- Keep all chemical containers closed when they are not in use.
- Wear comfortable, sturdy shoes. NO high heels, sandals, open-toed shoes, roller blades, or bare feet will be allowed. Long hair should be tied back.
- Apply aerosol paints, fixatives, and adhesives in a spray booth or well-ventilated area.

8.2.2 Rules for working with stationary machines and hand tools

- Shop supervisors may prohibit shop access or machinery use for any reason.
- Do not attempt to use any tool or machine before being fully trained in its use by your faculty. It is your responsibility to ask for assistance if you are unsure how to safely use a tool, machine, or equipment.
- NEVER WORK ALONE.
- DRUGS AND ALCOHOL (or being under the influence of drugs/alcohol) ARE STRICTLY FORBIDDEN!
- Shop supervisor MUST be present when power machines are in use.

- ALWAYS WEAR SAFETY GLASSES when using chemicals or performing operations that could create flying projectiles (some operations require additional protective equipment).
- No loose clothing (ties, scarves, loose sleeves) may be worn in the shop.
- No open-toed shoes or short pants allowed in the shop.
- Remove all jewelry before beginning work, including rings, necklaces, bracelets, and watches.
- LONG HAIR must be contained and pulled back tightly in a bun. Long beards must also be contained.
- Understand your operation before you begin or ask your supervisor for help.
- DO NOT USE DAMAGED EQUIPMENT or equipment that does not appear to be operating normally--report condition to shop supervisor.
- When using a hand-carving tool or X-Acto knife[9], keep your hands behind the tool and cut away from your body.
- Beware of hot glue guns—they can cause serious burns.
- All guards and shields must be in secured in place prior to operating equipment. Remove adjusting keys and wrenches before turning on tool or machine.
- Always check wood for screws or other embedded metal objects.
- Clear dust and debris before and after machine use. Keep floor around tool or machine work area free from scraps and debris
- KEEP AISLES, EXITS AND ACCESS TO EMERGENCY EQUIPMENT CLEAR.
- Never talk to or touch the machine operator.
- No cell phone use.
- DON'T WORK IF YOU ARE TIRED! Take frequent breaks to stay alert.
- Portable music players may not be used; store them at the entrance to the shop prior to working—no loud music.
- Food and drinks are permitted in designated areas only.
- Compressed air used for cleaning equipment must not be greater than 30 psi pressure. Do not use compressed air to clean skin or clothing.
- Immediately report all problems or concerns to your instructor or the shop supervisor.
- Use the right tool. Don't force a tool or machine to do a job for which it was not designed.
- Allow the tool or machine to come to a complete stop before attempting any adjustments. Disconnect power when servicing, changing blades, bits and cutters.
- Any tool or machine found to be out of order or malfunctioning in any way should be immediately reported to the Technical Director.
- Know the location of the nearest fire extinguisher and learn how to use it[10].

Stationary Power Tools

- Do not use any machine unless you have been trained and approved by your faculty or supervisor.
- Do not operate a machine without its safety guards in place and in good working order.
- Think through all operations carefully before turning on the machine. Think twice, measure twice, cut once.
- Before the power is turned on, remove all tools, wood scraps, or other materials from the machine table. Vibration from the machine might cause these items to move into the path of a moving part.

[9] See Section 2.4.7 for proper disposal of used blades and other sharps.

[10] There is no requirement to use a fire extinguisher in the event of a fire. However, if you have been trained, if the fire is small (rule of thumb: less than a wastepaper basket) and you feel you can capably use the fire extinguisher, locate the nearest fire extinguisher—pull pin, aim, squeeze and sweep (PASS) for use. Contact Campus Safety at 358-2228 as an additional follow-up and to ensure the fire extinguisher is replaced.

- Check the setup of the machine carefully for each job before turning on the machine.
- Never leave a machine unattended while it is still running.
- Do not overreach. Keep proper footing and balance at all times.
- Obtain help when handling long or broad pieces of wood or other materials.
- Make sure that spectators do not stand directly in line with revolving cutters or material.
- While a machine is running, be alert to noises that might mean it is not operating properly. If it does not sound right, shut it off and get help from the technical director.
- Once a machine has been turned off, do not use a stick or your hands to slow down or stop moving parts.

Portable Power Tools

- Use only a tool that can handle the job adequately.
- Before starting a motor, always check to see that the tool is in safe operating condition and that there are no loose parts.
- When a power tool is not in use, disconnect it at the outlet. It is not completely safe to trust tool switches. When you disconnect the tool from the outlet, do not pull the plug from the receptacle by yanking on the power cord.
- Hold tool firmly with both hands. Use a vise or clamp to hold work whenever possible.
- Do not activate a tool while carrying it at your side.
- Always make sure that the power cord is out of the way of the saw blade and that it is in good condition.

8.3 Clothing Safety

- Never wear loose clothing of any kind, such as a necktie, gloves, long sleeves or anything else that might get caught in moving parts.
- Long hair should be tied back out of the way.
- Rings, bracelets, necklaces, and wrist watches should not be worn while operating power tools and machinery.
- Shoes should have thick soles and should provide protection that can withstand the weight of heavy objects that might accidentally fall on your feet. Sandals or open-toed shoes are not allowed in the set shop.
- Long pants are recommended when working in the scene shop and must be worn when welding.

8.4 Fall Hazards, Ladders, Personnel Lifts

In general, fall protection is needed for any surface that is greater than four feet, although OSHA recognizes it is not appropriate to put guardrails at the edge of stages. Assigning crossover paths and appropriate blocking keeps actors from areas of danger. Other potential fall hazards are associated with the use of scaffolding, choral risers and other stage props.

Videographers are especially prone to catastrophic falls when they are filming aerial shots. Only authorized employees are permitted to have limited access to the rooftops of selected buildings. Students are specifically prohibited from roofs of any college building, unless being specifically escorted by authorized employees. Limited rooftop access is permitted provided that the area being accessed does NOT come with 6 horizontal feet of the roof's outer edge or other location presenting a potential fall distance of greater than six vertical feet (i.e., from a higher portion of a flat roof to an adjacent lower portion), OR is currently protected by a parapet or other solid barrier at least 42-inches in height, and the individual is accompanied by an authorized employee. All other circumstances involving rood access requires application of the Fall Protection Program (http://www.keene.edu/ehs/Fall%20Protection.pdf).

- Students are not required to use ladders or personnel lifts.
- Do not stand on the top of any ladder.
- Any time a student climbs above 8' on a ladder, it must be held by another student.
- Do not leave anything unattended on the steps of a ladder or on the top of a ladder or personnel lift.
- Make sure a ladder is firmly placed before climbing.

- Do not lean or overreach while on a ladder or personnel lift.
- Never move a ladder or personnel lift while someone is on it.
- Always adjust and lock the outriggers and/or casters before climbing the telescoping ladder.
- Outriggers must be in place and secured before raising the personnel lift.

8.5 Rigging System

- Do not use the rigging system without proper training.
- Do not operate the rigging system without a spotter or a clear view of the stage.
- Be sure the load is properly balanced. Always release the brake carefully and slowly.
- Do not leave a line set without locking the brake.
- Attachment and removal of scenery to and from battens shall be done under the supervision of an authorized member of the shop staff.
- Changing weights shall be done under the supervision of an authorized member of the shop staff.
- When changing weights on a loading gallery above the stage floor, the floor must be cleared of people back to the proscenium arch before any weights are moved. Sound off when starting and when finished. A spotter must be stationed on the floor to keep people from walking in the vicinity of the counterweight arbors while weights are being changed from above.
- When loading a batten, always load the batten first and the arbor last when changing weights at the loading gallery above the floor.
- When unloading a batten, always unload the arbor first and the batten second when changing weights at the loading gallery above the floor.
- Sound off when moving a line set in or out during rigging or construction activities.
- Do not move a line set without warning any persons who may be working on the grid.
- If a line set runs away and is too heavy to safely stop, warn all present and take cover.
- The lock rail should be labeled with what is on each line set and which line set(s) are not to be moved.
- In a performance situation, only move lines on cue. Moving a line before a cue could cause severe injury or damage to persons and property on stage. If the line set seems out of balance, don't move it. Notify the technical supervisor immediately.
- If you are unsure about any aspect of the rigging system, ask the technical supervisor.
- It may be necessary, due to the size or configuration of a piece of flown scenery, to add or remove weights from the arbor when it is down at stage floor level. This could be a potentially dangerous procedure and must be done only under direct supervision of a technical supervisor.

8.6 Costume Design Safety

Costume Design comes with its own unique set of safety hazards.

8.6.1 General Rules

All individuals using the Shop, supervised or otherwise, must observe the following:

- Costumes you have used for a show or project must be cleaned before returning to stock. *Discuss laundry questions with the shop supervisor*.
- Clean up after yourself!!! *This means clearing the worktables, ironing board, and floor of any and all debris, pins and remnants*.
- Return unused stock items to their proper places.

- Use the **stepladder** for anything you cannot reach. *It is a safety and liability issue and we do not want anyone to get hurt.*
- No food or drink in the shop.
- Unplug the iron.
- Spray paint **outside only** and cover dummies in plastic if painting on the dummy.
- Cover surfaces if painting or crafting with glue.
- Only dye in the designated washing machine and clean up stains.
- No parties or meetings in the shop without special permission.

Access to Shop equipment is available by appointment and under supervision only. Anyone who wishes to use the shop equipment must attend an orientation with the Shop Supervisor or demonstrate a familiarity and experience with equipment usage. Knowledge and understanding of our equipment ensures that everything is kept in good working order and helps keep down the cost of our repair bills. Available equipment includes several sewing machines, overlock/serger machines, scissors, dye materials, patternmaking materials, fabric, notions and trim, etc., and we request that you be responsible in your use of these resources.

Supervision is REQUIRED for use of the shop to dye materials and must be scheduled in advance. Dyes are chemicals and safety precautions must be observed. Dye materials are also limited.

8.6.2 Sewing Safety

Information available from the U.S. Consumer Product Safety Commission indicates a total of approximately 2,700 people were treated in hospitals for sewing machine injuries during 2005. Most of the injuries (60%) were puncture wounds and cuts to fingers. Many of the injuries were caused by operator error or inattention and could have been prevented by understanding how a sewing machine works and maintaining awareness of potential hazards.

Before Using a Sewing Machine

- Thoroughly review and understand information provided in the owner's manual with particular attention given to descriptions of safety procedures.
- Always inspect the sewing machine for damage or disrepair, including the power cord. Assure all ventilation openings are clear of lint and scrap cloth. Inspect all machine settings and adjustments and modify as necessary for the sewing task you intend to perform. If a sewing machine fails your pre-use inspection, notify the Supervisor. Do not use the sewing machine until it has been repaired.

Operating A Sewing Machine

- Only use a sewing machine for its intended purpose as described in the operator's manual.
- Never look away from the machine while it is sewing. If you need to look away, stop sewing first.
- Use the proper type and size needle for the fabric being sewn.
- Never use a bent or damaged needle.
- For zig-zag or any other special stitching, use a throat plate that accommodates a wide stitch.
- Always maintain a safe zone, of about one inch, around the presser foot where fingers never enter when the sewing machine is operating. Keep your fingers to the side of the presser foot rather than in front of it.
- Learn to start and run the machine slowly and evenly.
- If the machine is difficult to start, gently turn the balance wheel to assist it.
- At the end of a row of stitching, turn the balance wheel away from you until the thread take up is at its top position. Then raise the presser foot and pull the fabric away.
- Never sew with the presser foot in a raised position. Do not force the fabric forward or backward while sewing. Hold the fabric firmly between your fingers and allow the feed dogs to pull the fabric.

- Never sew across pins. Remove each pin before it is pulled under the presser foot. Carefully use straight pins and when done using them, place in a proper storage container such as a pin cushion or plastic box.
- When using a serger, keep your fingers a safe distance from the knife blades.
- Do not use magnetic pin dishes or other magnetized objects near an electronic sewing machine.
- When using shears, cut away from your body in regular, small strokes. Resting the shears against a table allows for better cutting control. Clip threads with small scissors or a thread clip rather than large sewing shears.
- Always turn the sewing machine off and unplug from the power source before changing the light bulb, lubricating machine parts, and/or cleaning the machine.
- Regularly use a lint brush to clean the area around the bobbin. Remove the throat plate and brush out all the visible bits of thread and fuzz that accumulate. If you do it every time you wind the bobbin, you won't forget.
- It is recommended that sewing machines be lubricated every 6 months and sergers every 3 months. Follow the instructions in the owner's manual. If the machine has been stored or unused for a long time, lubricate and test the machine before using.
- Clean up the work space when finished with your sewing task.
- If you suffer a puncture or cut wound, tell your Supervisor immediately. Wash the wound with soap and water and cover with a clean bandage. Seek medical attention if the wound is large/deep or appears to be infected.

8.6.3 Hot steaming / ironing Safety

Never hold your hand directly in the steam. Temperatures can reach 200°F when hot steaming garments. Burns can occur more quickly than you think. Wear safety glasses and use a teflon coated glove to handle hot steamed garments to prevent skin burns. Always turn off and unplug irons and steamers after use.

8.6.4 Spraying Shoes with Color

Color enhancing sprays and other aerosol sprays contain chemicals, such as toluene and acetone, that can irritate the respiratory tract, cause dizziness and headaches if not used properly under the costume shop chemical fume hood, outside, or in the third floor spray booth.

Garments or shoes often need to have a decorative finish put on them for a specific production. Adhesives, glitters and shiny metal powders all contain chemicals. Safety Data Sheets should be reviewed before use so proper ventilation, personal protective equipment can be worn while using these products.

APPENDIX A - STUDIO SAFETY INSTRUCTIONS

General

- Emergency Phone and Phone Numbers: Each instructor will indicate the location of emergency phones and contact numbers. Note the locations of other phones and professors near the laboratory in case of an emergency.
- Exits: Note the location of exits in the laboratory and keep in mind the quickest and easiest way to exit the building in case of an emergency. Keep the exits clear of coats, equipment, book bags, etc.

Fire Equipment and Fire Safety

- There are several sources of fire hazards in the studio. Hot plates and glue guns can become extremely hot and should always be monitored. PAY ATTENTION to your surroundings...do not leave ANY projects unattended;
- Keep tables and benches clear of clutter.
- There are fire extinguishers located in the studio or shop[11]. Larger fires may require the evacuation. In these extreme cases, exit the room, shut the doors, and call the fire department. Leave these types of fires to the professionals;
- Safety showers provide a large amount of water (in a very little amount of time) and may also be used to put out clothing fires if the fire blanket is too far away. Typically, the safety shower is used when people have been involved in large-scale chemical spills (i.e. if they have been drenched with acid). A person in this situation should also be stripped of their clothing to avoid further chemical contact with the skin.

Chemicals and Chemical Safety

Although many of the chemicals used in the studio are somewhat safe, things still can happen. To avoid any accidents, it is important once again to stress the importance of being prepared for class. This means reading over the assignment prior to class and also taking the class seriously.

Horseplay will not be tolerated. Failure to respect this regulation will mean that students will not be permitted to participate in the class. Some situations that will require dismissal include:

- DO NOT mix any chemicals that you are not asked to. Mixing the wrong chemicals together could lead to unexpected and dangerous chemical reactions;
- DO NOT put any chemicals in or near your mouth; and,
- DO NOT throw or “squirt” chemicals at anyone else.

Safety Glasses and Appropriate Attire

Safety glasses must be worn at all times when working with hazardous chemicals or when conducting hazardous operations. Safety glasses protect your eyes from chemical splashes, flying objects, clumsy neighbors, and a whole list of common mishaps. Safety glasses can be purchased at the bookstore. Failure to respect this regulation will mean that you will not be permitted to participate in the class. Safety glasses cannot be shared and they will not be loaned out. Safety glasses must also be worn over eyeglasses. Check with your instructor if you can try on a couple of pairs so that proper fitting glasses can be purchased. Contact lenses should be worn with caution. Ask your instructor for more information.

In addition to wearing safety glasses, pay attention to appropriate clothing to be worn. If possible, wear older clothing, preferably natural materials such as cotton as opposed to synthetic materials such as polyesters and nylon. Do not wear loose-fitting clothes. Wear comfortable, sturdy shoes. NO high heels, sandals, open-toed shoes, roller blades, or bare feet will be allowed. Long hair should be tied back.

[11] There is no requirement to use a fire extinguisher in the event of a fire. However, if you have been trained, if the fire is small (rule of thumb: less than a wastepaper basket) and you feel you can capably use the fire extinguisher, locate the nearest fire extinguisher—pull pin, aim, squeeze and sweep (PASS) for use. Contact Campus Safety at 358-2228 as an additional follow-up and to ensure the fire extinguisher is replaced.

Safety Equipment

Eyewashes are designed to deliver a stream of water (or saline solution) directly into the eye to remove any chemicals or laboratory debris. You will need assistance from your lab partner to use the eyewashes. Begin by using the eyewash located on the side of the sink. Holding your eyelids open, wash out your eyes for at least 10 to 15 minutes.

Some of the studios/shops are also equipped with fume hoods. Hazardous and volatile chemicals are usually kept here. Also, certain reactions will be performed in the fume hoods. Whenever a reaction is to be done in the fume hood, it is safe to assume that it should stay there.

Chemical Disposal

You will be advised of chemical disposal. Federal government safety guidelines prohibit the disposal of certain chemicals (solvents, organic waste, heavy metals) down the sink. Chemical waste should only be disposed of in appropriately labeled containers. Broken glass and sharps must also be placed in glass disposal containers. Broken glass, especially chemically contaminated glass, should never be placed in regular trash containers (for the safety of the janitorial staff).

Report all chemical spills and accidents (no matter how small) to your instructor.

Common Injuries

Cuts: The studio is equipped with a first aid kit. For minor cuts, wash the affected area thoroughly with soap and water, remove any foreign particles (if necessary), and bandage. For major cuts, alert your instructor.

Burns: For burns obtained from hot equipment, glassware, or flames, flush the area of the skin for 10 to 15 minutes with cold water. Apply bandage from the first aid kit. For chemical burns, wash thoroughly. Alert your instructor for treatment.

Chemical Spills: If chemicals are spilt, your instructor will provide instructions for cleaning them up. If you spill any chemicals on your hands, wash the area for 5 to 10 minutes with large amounts of water. If any rash or burning begins, inform your instructor. If a small amount of chemical is spilled on clothing, remove the contaminated clothing and wash the skin underneath for 5 minutes with water. For larger spills, it may be necessary to use the safety shower.

Sample Safety Contract

Instructors should have their students sign a safety contract. It is the responsibility of the instructor to maintain the safety contracts on file. A sample pledge is included below:

Chemistry Laboratory Contract
KSC Chemistry Department
Fall 2007
INCHEM 111 lab

I have read the preceding introduction pages and participated in the chemistry laboratory safety lecture.

I understand the safety precautions as well as the course requirements that have been outlined here.

I understand that failure to cooperate with any of the rules outlined here will result in my expulsion from the scheduled experiment and no make-up will be available.

Lab section:_____ Printed name: _____

Date:_____ Signature:_____

APPENDIX B –SELECTING APPROPRIATE GLOVES

Use non-latex gloves, such as nitrile or vinyl. Gloves should be replaced immediately if they are contaminated or torn. In situations involving extremely hazardous chemicals, double gloves are recommended. Gloves should be carefully selected for their degradation and permeation characteristics to provide proper protection. Permeation describes how some chemicals can pass through a glove on a molecular level. The thin, vinyl or nitrile gloves, popular for their dexterity, are not appropriate for highly toxic chemicals or solvents. Key concepts to remember include:

- **Understand the toxicity and hazards of the materials you work with** - Consult the MSDS for each chemical/product you work with for additional information on glove selection. Use special care handling chemicals with high acute toxicity and those with significant chronic effects (known carcinogens etc.);
- **All gloves are permeable** - Permeation is dependent on many factors including the material handled, extent and length of contact. Glove composition, thickness, fatigue and conditions of use also factor into glove effectiveness;
- **There is no such thing as an "ideal" chemically resistant glove** - Some gloves may offer superior protection but limit dexterity and tactile sensitivity or are prone to tears or punctures. Sometimes the best glove is actually two gloves worn together. Reusable gloves (ex. nitrile, neoprene, butyl or Viton) can be worn over flexible laminate gloves to combine the advantages of both;
- **Consult the manufacturer's chemical resistance guide** - Chemical resistance varies according to manufacturer. In most cases the information provided includes degradation (a measure of the gloves tendency to swell, discolor or otherwise change due to chemical contact) and permeation. Chemicals can oftentimes permeate gloves without causing visible change. Breakthrough is the time elapsed between first contact outside the glove and detection inside;
- **Understand the difference between reusable and disposable gloves** - Disposable gloves are thin single use gloves generally 4 - 8 mils thick compared to reusable gloves which are 18 - 28 mils thick (1 mil = 1/1000 inch). Disposable gloves are not suitable for handling aggressive or highly hazardous chemicals and should never be re-used. Disposable gloves can provide barrier protection where contact with chemicals is not likely. Whenever a disposable glove comes in contact with hazardous chemicals it should be removed, followed by thorough hand washing and new gloves for continued work. Bag contaminated gloves for disposal as hazardous waste; and,
- **Care of reusable gloves** - In the lab or studio most chemical handling does not require immersion or extensive/prolonged contact. As a result it is normally not necessary to replace heavy-duty gloves after each use. Before removing reusable gloves, thoroughly rinse them off and then allow to air dry. Inspect reusable gloves before each use for discoloration, cracking at flexion points or damage (punctures or pin holes) - discard if discovered. If you suspect they have become contaminated bag them for disposal as hazardous waste.

Glove Materials

- Viton™ - Excellent resistance to chlorinated and aromatic organic solvents – expensive;
- Butyl - Good resistance to aldehydes, ketones and esters – expensive;
- Nitrile - Wide range of applications with puncture and abrasion resistance;
- Neoprene - Wide range of resistance to acids, caustics, and alcohols;
- PVC - Resists acids and caustics but not organic solvents;
- Natural rubber/latex - Minimal chemical resistance, often combined with other materials for a broad range of applications. Latex allergies limit widespread use; and,
- Flexible laminates - North's Silver Shield/4H® glove is a five-layer laminate material that offers the best chemical resistance in most cases. It is best used as an inner liner under re-usable gloves to maintain dexterity and tactile sensitivity when handling extremely hazardous materials.

The following websites provide chemical protective clothing (CPC) recommendations for the chemicals listed in the *NIOSH Pocket Guide to Chemical Hazards, June 1997 Edition* (Publication No. 97-140): http://www.cdc.gov/niosh/prot-cloth ncpc1.htm and http://www.cdc.gov/niosh/prot-cloth/ncpc2.html.

Glove Compatibility Charts

The following are links to various companies providing gloves. Glove compatibility or chemical resistance charts for those gloves are supplied by those companies. Please use these charts to ensure the gloves being used to handle chemicals are providing adequate protection to the wearer. All chemicals will not be listed on these charts. **Note that two similar gloves supplied by two separate manufacturers may not provide the same level of protection to a specific chemical**. Therefore, it is necessary to consult the manufacturer's specific compatibility chart for the brand of gloves being used.

Understanding terms used in glove compatibility charts:

- Breakthrough time: Time it takes for the chemical to travel through the glove material. This is only recorded at the detectable level on the inside surface of the glove;
- Permeation Rate: Time it takes for the chemical to pass through the glove once breakthrough has occurred. This involves the absorption of the chemical into the glove material, migration of the chemical through the material, and then deabsorption once it is inside the glove; and,
- Degradation rating: This is the physical change that will happen to the glove material as it is affected by the chemical. This includes, but is not limited to swelling, shrinking, hardening, cracking, etc. of the glove material.

Compatibility charts' rating systems will vary by the manufacturer's design of their chart. Many use a color code, where red = bad, yellow = not recommended, green = good, or some variation this scheme. A letter code may be used, such as E = excellent, G = good, P = poor, NR = not recommended. Any combination of these schemes may be used, so please understand the chart before making a decision on the glove to be used.

Manufacturer	Website
Ansell Pro	http://www.ansellpro.com/specware/index.asp Ask the Ansell Expert
Assurance Chemical	http://www.ehs.ufl.edu/Lab/CHP/Assurance.pdf
Best USA	www.chemrest.com
Delta Gloves	www.deltagloves.com/chemchart.htm
Fisher Scientific	Use the Kimberly Clark website for the Fisher brand purple nitrile, PFE (Powder Free Exam latex, Healthtouch (vitamin E inside) latex exam and Kleengard purple foam nitrile gloves only. Kimberly Clark manufactures these for Fisher.
Kimberly-Clark Professional	http://www.kcprofessional.com/us/mkt/ChemicalSelectorGuide/
MAPA Professional	www.mapaglove.com/ChemicalSearch.cfm?id=1
Marigold Industrial (Comasec)	http://www.marigoldindustrial.com/USA/Technical.aspx
MCR Safety	http://www.mcrsafety.com/tools/permeation.shtml
Microflex	http://www.microflex.com/ChemChartLatexNitrile.pdf
North	www.northsafety.com
Oak Technical	http://www.oakgloves.com/
Safeskin	http://www.kcprofessional.com/uk/?PageRequest=protect/SS_NonSterile.asp
Saft-T-Gard International, Inc.	http://www.saftgard.com/anonymous/SolvaGard1.pdf
Sempermed	http://www.sempermedusa.com/content.asp?action=productslisting
Superglove	http://www.polyco.co.uk/downloads/chemical_resistance_guide.pdf
VWR-Safety	http://www.vwrsp.com/safety/pdf/2003-july_glove_selection.pdf

More information on specific types and uses of personal protective apparel is available from EHS.

APPENDIX C – INCIDENT REPORT AND SPILL REPORT FORMS

Page 1 of 2

INCIDENT REPORT

(INJURY/OCCUPATIONAL ILLNESS AND/OR ACCIDENT OR NEAR MISS)

Keene State College

INSTRUCTIONS FOR PERSON COMPLETING THIS FORM: Please complete Section 1 of this form for any type of incident. Section 2 must also be completed if there has been an injury. Section 3 must be completed by a supervisor or appropriate campus official for any incident involving an employee; and Section 4 must be completed by a supervisor or appropriate campus official for any employee who sought medical attention.

This report must be filed with the KSC Human Resource Management Office [illegible] within two (2) days of date of incident/injury/illness.

Section 1: This Section must be completed for any type of incident listed below.

Type of Incident: Injury____ Accident____ Hazard____ Near Miss____

Date of Incident: ____ Time: ____ Day of Week: ____

Employee: Faculty____ Staff____ Complementary ____ Student Worker____

Other: Student____ Visitor ____ Contract Employee: ____

Name: ____ Date of Birth: ____ Male / Female____

Home Address: ____ Zip Code____

Home Phone: ____ Work Phone: ____

Occupation: ____ Department: ____

Location where incident occurred: ____

Describe the injury, accident, or incident. Include what was being done, how, with what tools and in what conditions. Use drawings or maps and additional sheets if necessary.

Cause of Incident (circle all that apply):

Animal	Electricity	Repetitious movement	Machinery
Insect	Hit by object	Slip or Fall	Tool
Plant	Hot liquid/object	Weather	Sharp object
Chemical	Lifting action	Quality of Air	Needle
Person	Twist	Airborne particle	Fire/Explosion
Criminal Act	Pinch/squeeze	Car accident	Other:____

Witness(es) (list witness(es)' name(s), address(es), phone numbers and attach statement(s)):

Section 2: This Section must be completed if there has been an injury/illness.

Injured body part (if applicable): ____

Injury type (circle all that apply)

Cut/puncture	Splinter	Body fluid exposure	Fumes/dust/smoke inhalation
Bruise	Heart attack	Electrical shock	Other respiratory
Muscle pull/strain/sprain	Stroke/seizure	Hernia	Vision loss
Bite/scratch	Repetitive stress	Rash/dermatitis	Hearing loss
Broken/fractured bone	Heat exhaustion	Allergic reaction	Death
Amputation	Concussion	Stress	Other:____

Did you seek medical treatment? yes / no If yes, where? ____ Admitted to hospital overnight? yes / no
If yes, and victim is employee, Section 4 must be completed. If yes, how many days?

Signature of person reporting injury/occupational illness:

____ Date: ____

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Section 3: This Section must be completed by supervisor or appropriate campus official any time an incident has been reported.

Was the employee doing something other than his/her required duties at the time of the injury? _____

If yes, what, why, and directed by whom? _____

Describe in detail what the employee was doing, how it was being done and tools, people or machines involved. If possible give details such as weights, heights, temperatures, chemicals, etc.

What caused the incident/injury/illness to occur (please circle all that apply)?

Environmental	**Personal**
Improper or defective equipment	Lack of personal protective equipment
Location (poor layout, poor lighting)	Lack of skill, training or experience
Poor housekeeping (clutter, spillage, breakable objects)	Improper apparel (loose clothing, jewelry, etc.)
Poor ergonomics (lifting, workstation design, inadequate tools)	Bodily conditions (fatigue, physical/mental impairment)
Inadequate safeguards, unsafe job design	Adequate skill but failure to execute and follow direction
Other:_____	Other:_____

Describe results of accident investigation (Why did this incident occur and can something be done to avoid a recurrence? If reporting a hazard, suggestions for minimizing or eliminating the hazard):

Section 4: The following information must be completed by supervisor or appropriate campus official if there has been an injury/incident requiring medical attention.

Date of Hire: _____ Hours worked/Day: _____ Days worked/Week: _____

Hourly Rate: $_____ or Annual Rate: $_____ Occupation: _____

Was the employee given the WC information on approved providers? yes / no Soc. Sec. No.: _____

Lost time? yes / no If yes, beginning date: _____

Has injured returned to work? yes / no If yes, date returned: _____

NOTE: If no lost time as of the date of this report, please send written documentation of lost time when it occurs.

Date injury/illness reported to supervisor or campus official: _____

Name of supervisor or campus official (print): _____

Signature supervisor or campus official: _____

Date: _____

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Spill Report
Keene State College

Date/Time:	**Location:**
Product:	**Quantity:**
Responders:	**Reported by:**
Notifications? Campus Safety 358-2228 Sylvie Rice, EHS 358-2879 or 209-1362 If spill discharges to sewer immediately call: Eric Swope (Keene Wastewater Pretreatment Coordinator) 357-9836, ext.6504 If there is a threat to human health or the environment or when there can be off-site impact, immediately call: NHDES 603-271-3899 or 603-223-4381, and National Response Center 800-424-8802 Environmental Protection Agency (EPA) Region I Spill Response 617-918-1279	**Date/Time:**
Description/Photograph(s):	