

hazards to the extent possible. Minimize hand to face contact – use local exhaust systems.

- Use lubricants, protective gloves, thick cloth and proper procedures when inserting tubing or working with glassware.
- Do not use any distracting electronic equipment in the laboratory – turn it off and put it away.
- Do not wear your PPE outside of the laboratory – it must be considered to be contaminated.
- Wash your hands whenever leaving the laboratory, changing gloves, and at least hourly.
- Safely store or locate your personal items to prevent their contamination or obstructions.
- Smell substances only as directed and only by fanning smell toward you.
- Never pipet by mouth!
- Never look into test tubes or containers from the top – only through the sides.
- To the extent possible, administrative tasks should not be performed in the laboratory work area.
- Report all injuries or exposures to the instructor immediately! *Instructor is to call the EHS Office.*

HOUSEKEEPING

- You are responsible for ensuring that a clean workspace is maintained both in your own work area and the common working areas. The lab environment should be at least as clean and orderly when you finish your work as when you began.
- Immediately clean laboratory benches or tables free of spilled chemicals or biologicals. Clean up, disinfect, or decontaminate, spills as directed by your instructor.
- Avoid physical hazards by keeping drawers and cabinets closed and benches/tables clear.
- Clean glassware, tools, and equipment before returning them to storage or for re-use.
- Prevent tripping and contamination hazards— never place materials on the floor – particularly chemicals or biologicals.
- Dispose of chemical lab wastes in compatible, closed containers bearing a LAB WASTE label.

- Broken glass should be placed in *Broken Glass* boxes – not in trash cans.
- All sharps must be placed in *Sharps* containers.
- Potentially infectious wastes must be placed in *Infectious* or *Biohazard* containers, red bags, or boxes.
- Maintain all aisles and corridors clear and exits open at all times.



The preceding are only basic laboratory safety rules and precautions and are far from complete in scope or detail. They must be supplemented by general laboratory safety training and laboratory-specific training. Please contact the Ball State EHS Office for more information on laboratory safety at 765-285-2807 or on the EHS website at:

<http://cms.bsu.edu/about/administrativeoffices/riskmanagement/ehs/envhealth>.

The American Chemical society publication, *Safety in Academic Chemistry Laboratories* available at this link: <http://chemistry.org/committees/ccs> is a basic reference for chemical laboratory safety, as is the National Research Council, *Prudent Practices in the Laboratory*:

(<http://www.ncbi.nlm.nih.gov/books/NBK55878/>)

Note: Any concerns by students, staff, faculty, or researchers regarding laboratory safety or integrity should be immediately brought to the attention of the laboratory instructor, manager, or principal investigator, followed by the Department Chair, if necessary. If not resolved, the BSU Chemical Hygiene Officer should be contacted at 765-285-2807, by email at ttrussell@bsu.edu, or by radio at 285-5081.
Emergency: Call 285-1111 (BSU PD) or 911.



UNIVERSITY LABORATORY ACTIVITIES PRESENT HAZARDS AND RISKS!

Scientists and practitioners understand the risks involved in the laboratory and have established a set of laboratory safety practices. This guide summarizes the basic safety rules that are applied in all Ball State University laboratories.



ADMINISTRATIVE PROTECTIONS

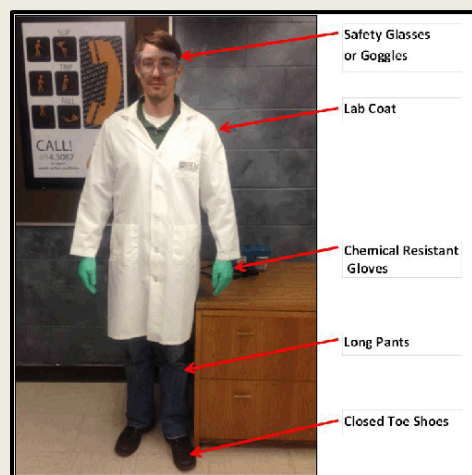
- All science laboratories and art studio or workshop entry ways are to be posted with signs that clearly identify the major safety hazards therein, access restrictions, required personal protective equipment, prohibitions, and emergency contacts. Instructors, faculty, and researchers are expected to set the example by following these guidelines.
- General laboratory safety training is to be provided by the department, school, or the EHS Office to all students, staff, faculty, and researchers prior to work in any laboratory.
- Lab-specific safety training is to be provided for the particular physical, chemical, or biological hazards present in each laboratory (location of safety equipment, chemical information, PPE use,

emergency procedures, etc.) by the lab manager, instructor, faculty, or researcher.

- An inventory of all hazardous chemicals, and access to the Safety Data Sheets (SDS) for those chemicals, must be readily available at all times.
- Access to the BSU Chemical Hygiene Plan (CHP), Standard Operating Procedures (SOPs), and specific written protocols must be available and those policies and procedures must be followed.
- All chemical and biological containers must be labeled with the identity of, and hazards presented by, the material.

PERSONAL PROTECTION

- Follow the prescribed personal protection equipment (PPE) procedures for the particular laboratory and activity. This applies to guests and any person in the lab handling or exposed to hazardous chemicals, physical, or biological hazards.



- Clothing must protect you from accidental spills or exposure. Clothes should cover the body to the extent practicable, but must include long pants and closed-toe shoes. Sandals and flip-flops, high heels or shoes made of woven materials are not allowed. Oil-resistant slip-proof soles are preferred.

- Lab coats or chemical-resistant aprons or clothing are normally required and are always advisable.
- Minimize skin and respiratory exposure.
- Eye protection is required ranging from safety glasses to chemical splash goggles, to face shields.
- Long hair must be tied back or otherwise restrained and jewelry must be removed before entering the laboratory.
- Gloves are often required in the laboratory-- ensure proper fit and chemical resistance.
- Additional PPE requirements may be required including thermal protection, fire-resistant coats, puncture-resistant gloves, etc.
- If students or staffs do not have the required PPE for the laboratory or a given activity, they will be excluded from the class or participation in that educational or research activity.

LABORATORY PROTOCOL

- Your responsibility to prevent accidents in the laboratory extends to others in addition to yourself. The laboratory experience should be enjoyable but is serious--it is not a time for play. Be aware of what is happening around you and report any questionable behavior.
- Always plan laboratory work before executing it. Providing for safety and avoiding potential accidents are important elements of the plan. You must understand the hazards associated with the chemicals, biologicals, or physical apparatus before you start or continue the experiment or procedure.
- If you are unsure about the hazards, the procedures, or the protection you need, the Safety Data Sheets, the BSU CHP, the SOP, your instructor, faculty, or the researcher should be consulted. **YOU MUST ASK IF IN DOUBT!**
- Do not work alone in a laboratory without faculty or supervisor approval and other precautions.
- Always alert others before lighting a flame
- Flames are never allowed when flammable gases or liquids are in use in the space.
- Use a safety shield when working with highly reactive chemicals and mixtures.

- Label solutions / experiments, with name & date.
- Know where to find and how to use all emergency equipment (eye washes, showers, fire extinguishers, spill kits) in the laboratory.
- Never perform unauthorized experiments— especially do not scale up the procedure! Avoid deviation from the lesson plan or research protocol unless authorized by instructor.
- Be certain that you understand the proper use and operation of all laboratory equipment.
- Always assemble laboratory apparatus away from the edge of the laboratory bench.
- Always check your glassware and discard any with chips, breaks, or obvious flaws.
- Never leave experiments, flames, or running water unattended without notifying your faculty, instructor, or supervisor. Post signs to warn others. Have an approved contingency plan in the event of service interruptions.
- Use chemical fume hoods for all operations in which toxic, corrosive, irritating, or flammable chemicals are involved. *Confirm the hood is operating properly before starting your work!*
- Keep the hood sash within the safe operating height and between your face and the work and keep the work at least 6 inches inside the hood front.
- Never use flammable or toxic materials in a biosafety hood – these recirculate air to the room.
- Use proper disinfectants and exposure time for disinfecting surfaces and equipment that may be contaminated with biological agents.
- Lab doors and windows must remain closed to maintain negative pressure and proper fume hood operation.
- Ensure that you are trained and confident in the procedures, chemicals, and equipment – *if not consult your instructor first!*

PERSONAL BEHAVIOR

- Eating or drinking in a laboratory is not allowed.
- Conscious efforts must be maintained to minimize exposure to all chemicals, biologicals, and physical