SCHOOL CHEMISTRY LABORATORY BEST PRACTICES

This bulletin provides a concise, actionable summary of essential safety practices for managing school chemistry laboratories. It supports both science teachers, who directly oversee laboratory activities, and school administrators, who are responsible for maintaining safe instructional environments.

Building a Culture of Safety

Creating and maintaining a safe laboratory environment requires shared responsibility:

Administrators

- Ensure safety policies, Chemical Hygiene Plans (CHP), and emergency protocols are implemented and maintained.
- Allocate resources for proper equipment, PPE, chemical storage, and waste disposal.
- Support teacher training and ensure compliance with PEOSH-aligned district safety programs.

Science Teachers

- Serve as the front-line safety leaders: instruct, model, and enforce safe practices.
- Provide safety training before experiments; supervise students at all times.
- Maintain safe laboratory conditions, proper labeling, storage, and chemical management.

Students – Teachers Must Ensure They Understand

- No food, drinks, horseplay, or unauthorized experiments.
- Proper PPE use: goggles, gloves, coats/aprons.
- Emergency procedures, chemical handling expectations, and behavior requirements.

Teacher Responsibilities

- Conduct regular inspections of safety equipment; report defects immediately.
- Maintain incident logs, training records, and chemical inventories.
- Know locations and operation of emergency shut-offs, eyewash, showers, fire blankets, spill kits, and extinguishers.
- Review hazards, SDS information, and lab procedures before each activity.
- Never leave students unattended in the laboratory.
- Enforce PPE use and safe conduct consistently.

Administrative Support

- Up-to-date Chemical Hygiene Plans.
- Adequate ventilation and compliant storage facilities.
- Teachers receive annual safety training.
- Emergency response procedures are communicated and drilled regularly.

Chemical Hygiene Plan (CHP) Must Include:

- Standard Operating Procedures for hazardous chemicals.
- Criteria for exposure control measures (Engineering, Administrative, Personal Protective Equipment).
- Functioning chemical hoods and documented inspections.
- Training requirements for employees working with hazardous substances.
- Medical consultation guidelines for exposure, symptoms, or incidents.
- Annual CHP review.

Chemical Purchasing & Inventory – Before Ordering Considerations

- Assess hazard severity using the SDS.
- Confirm that educational value outweighs risk.
- Verify appropriate storage, ventilation, and PPE availability.
- Order only the minimum quantities needed for the year.
- Avoid chemicals with high hazard classifications when safer substitutes exist.
- Maintain a cradle-to-grave tracking system documenting receipt, storage, and disposal.

Inventory Requirements

- Record chemical name, CAS number, date received, hazard classification, storage location, expiration date, and amount remaining.
- Maintain an updated digital or card database; inspect annually and remove deteriorating chemicals.

Chemical Labeling Standards – Every Container Must Be Labeled With

- Chemical name (matching SDS)
- Manufacturer or preparer
- Concentration
- Handling and hazard information
- Date received/opened
- Expiration date (if applicable)
- No unlabeled substances may ever be present in the laboratory.

Special Requirements

- Waste containers must state: “Hazardous Waste,” chemical contents, accumulation start date, and hazards.
- Peroxide-forming chemicals require tracked open & disposal dates.

Chemical Storage Requirements

General Storage Rules

- Store chemicals by compatibility, not alphabetically.
- Use cabinets with front-edge lips; secure shelving; keep locked and ventilated.
- Acids are stored in acid cabinets; nitric acid is stored separately.
- Flammables are stored in approved flammable storage cabinets.
- Toxics are stored in locked poison cabinets.
- Water-reactive chemicals are stored in dry, segregated locations.
- Never store chemicals:
  - On floors
  - Above eye level
  - Near heat/sunlight
  - With food or drinks
  - In personal refrigerators

Waste Minimization & Disposal

Minimization Strategies

- Buy smaller quantities.
- Use microscale experiments.
- Choose less hazardous substitutes (e.g., digital thermometers for mercury).
- Use pre-measured chemical packets where possible.
- Recycle when feasible (cyclic experiments).

Disposal Requirements

- Follow EPA/State hazardous waste definitions: ignitable, corrosive, reactive, and toxic.
- Never pour chemicals down drains unless explicitly authorized.
- Store waste away from sinks and drains; always label properly.
- Use licensed hazardous waste haulers for disposal.

Emergency Procedures

Always consult the specific chemical Safety Data Sheet (SDS) when responding to an emergency.

For Eye Exposure: Flush 15 minutes, hold eyelids open, remove contacts, seek medical attention.

Acid/Base Spills: Neutralize acids with sodium bicarbonate; bases with vinegar. Absorb with diatomaceous earth; dispose of as hazardous waste. For skin contact: flush with large volumes of water and remove clothing.

Mercury Spills: Evacuate area, seal HVAC, ventilate externally, follow EPA cleanup procedures.

Laboratory Safety Equipment That Must Be Provided & Maintained

- ANSI-approved eyewash stations and safety showers
- Chemical splash goggles & face shields
- Fire blankets, extinguishers, sand buckets
- Spill kits
- Chemical fume hoods (60–100 ft/min capture velocity)
- Ground-fault interrupter outlets
- Sharps and broken-glass containers
- Updated SDS library
- The Emergency Action Plan is readily accessible