

Safety Education for Early Lab Students

How do they learn it
before they need it?

Sheila Kennedy, CHO
Safety Coordinator

UC San Diego
Chemistry & Biochemistry
Teaching Laboratories

laboratory safety program

CHEM 7L, 7LM, 100A, 143A and 143AM

1. LEARN LAB SAFETY: chemistry.ucsd.edu/go/CHEM-labs
2. TAKE THE EXAM - on line & on time @ TritonEd.ucsd.edu

Access to ted.ucsd.edu? Contact UCSD Academic Computing & Media Services (acms.ucsd.edu/helpdesk/ 858-534-2267)



CHEM safety education page:

- safety education & exam information
- lab safety workshop with staff
- general lab safety
- study resources: books, videos
- **calendar of meeting & exam dates**
- practice exam
- second exam & review information



Go to TritonEd.ucsd.edu:

- your class's **LAB SAFETY TRAINING** page has your exam
- check the **MY GRADES** section for your results

ALL students in introductory lab classes are required to demonstrate an understanding of general laboratory safety and the UCSD Chemistry Teaching Lab Rules. Each student is responsible for studying laboratory safety and passing the safety exam. Students who fail to demonstrate an understanding of general laboratory safety and familiarity with the Chemistry Teaching Lab Rules will be dropped from the course with a grade of "W," where possible.



Teaching Labs

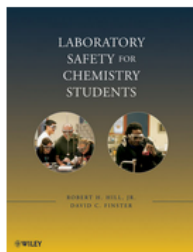
[CHEM Laboratory FAQs](#)

▼ Lab Safety Education

[Laboratory Regulations](#)[Safety Data Sheets \(SDS Access\)](#)[Emergency Response Form](#)[Emergency Evacuation - NSB](#)[Emergency Evacuation - York Hall](#)[▶ Laboratory Teaching Assistant](#)[▶ Lecture Demonstrations](#)[Contacts](#)

Useful Links

[LABORATORY RULES](#)



[LABORATORY SAFETY FOR CHEMISTRY STUDENTS](#)

[STUDY GUIDE: STUDENT PREPARATION FOR CHEM LAB](#)

[A PRACTICE QUIZ](#)

[WORKSHEET for SAFETY WORKSHOP](#)

[ENVIRONMENT, HEALTH & SAFETY](#)



Lab Student Safety Education & Safety Exam

As a student anticipating work in a chemistry laboratory you need to learn basic safety principles before beginning. During your laboratory work (as a student and as a professional) you will be expected to know:

- general laboratory and life safety principles,
- specific laboratory policies and procedures for each lab or area where you work.

The texts cited below provide the materials you'll need to inform yourself on these topics. Specific instructions for instruments and equipment are taught in class as new topics and instruments are introduced. Rules that are specific to an individual class are published in the syllabus for that class.

+ Expand All

▶ LABORATORY SAFETY EDUCATION PROGRAM

▶ SAFETY EXAM FOR INTRODUCTORY LAB STUDENTS

▶ CURRENT SCHEDULE: Safety Workshops and Exams

▶ TRANSFER, RETURNING AND EXTENSION STUDENTS

▶ ASSIGNED READING: General Lab Safety & the CHEM Teaching Labs Rules

▶ EXAM RESULTS

▶ AWARD-WINNING SAFETY PROGRAM

+ Expand All

CONTACTS

A NOTE FROM THE SAFETY COORDINATOR:

If you have questions about **Lab Student Safety Education** or our **Lab Safety Exam**, please carefully review these pages, as well as the [Teaching Laboratory FAQs](#). We teach, coach & test more than a thousand students in the first two weeks of each quarter, so it's helpful if we don't hear from everyone at once. If you think we have missed something, though, please do send an email & help us improve the process and the information.

~ Sheila Kennedy

In Chemistry & Biochemistry:

- [Suzanne Anderson](#), Director, Teaching Laboratories (534-4843).
- [Sheila Kennedy, C.H.O.](#), Safety Coordinator, Teaching Laboratories (534-0221).
- [Steve George, Ph.D.](#), Department Safety Officer (534-5906).
- [Judy Kim, Ph.D.](#), Vice Chair for Education (534-3199).

In Environment, Health & Safety,

- [Doug Harvey C.H.O.](#), UCSD Chemical Hygiene Officer (822-1579).
- [Jonathan Joyce](#), Research Assistance Program (822-6886)



Laboratory Hood User Checklist

- Know the location of nearest eyewash/shower & fire extinguisher
- Know the hazards of the materials to be used
- Check for a current certification sticker
- Verify that adequate face velocity exists (feel the air move **into** the hood)
- Always keep the hood sash between the operator's face & the work
- Keep upper body & head outside the plane of the hood sash*
- Keep baffle slots free of obstructions (by apparatus or containers)
- Work and place equipment ≥ 6 inches behind the sash
- Allow free flow of air currents across the hood work surface:
 - o Minimize storage in hoods
 - o Elevate bulky equipment on racks or feet (~ 1.5 in.)
 - o Move hands & equipment in & out of hood with slow, gentle actions
- Minimizing pedestrian traffic in the area to reduce cross drafts at hood face
- Never turn off a chemical hood (at UCSD, we have no ON/OFF switches)
- Report problems with hoods immediately:
 - o York Lab Staff (x40222; 858.534.**0222**)
 - o NSB Lab Staff (x24316; 858.822.**4316**)
 - o Facilities Mgmt. (x42930; 858.534.**2930**)
- If a hood malfunctions, post a sign to keep others from using it until it can be repaired – state problem & date reported



*The exception to this rule arises when arranging equipment in the hood. Lower the sash before beginning operations that produce fumes/vapors/gases.

LABORATORY SAFETY FOR CHEMISTRY STUDENTS



ROBERT H. HILL, JR.
DAVID C. FINSTER



BASIC LAB PRACTICES

EATING, DRINKING, GUM CHEWING, AND SMOKING ARE FORBIDDEN in lab (to avoid chemical ingestion, excessive inhalation of harmful vapors and ignition sources). Food, drinks, and smoking materials (including chewing tobacco) are permitted only in securely closed containers well away from lab work areas. As of 2014, UC San Diego (along with all of the UC campuses) is [smoke and tobacco-free](#).

Prudent practice. In any situation not covered by specific guidelines or the [LAB RULES](#), the careful worker will ask "What would a prudent person do?" (i.e., what would be the careful and sensible action?). Such "prudent practice" decisions save time, work and lives.

Arrive prepared. Understand the materials and equipment you will use in lab – contact your Instructor or TA for further information if the class materials provided are not clear. Know the hazard(s) of each substance in your work plan – list materials, hazards and the appropriate protection in your lab notebook as part of your pre-lab planning.

On **DAY ONE** and every day, bring to class:

- Chemical splash goggles;
- Long-sleeve, knee-length lab coat;
- Lab notebook & pen;
- Water-proof marker.

A laboratory is a workplace. The list of things **not permitted** in chemistry labs is long – begin with **anything** that might increase the chance of ingesting lab chemicals: eating, drinking, cooking, applying makeup, or smoking. Careful workers do not touch hands to their faces while working in lab. You know yourself best, make your own plan to take a break during the work period to remove goggles, get a drink or have a snack, if needed.

Attentive and serious behavior is expected at all times; rowdy or boisterous play – or pranks of any kind – will be cause for expulsion from lab.

Housekeeping. Store book bags and other extra materials away from work areas and off floors to protect them and to keep walkways clear. Keep work areas clear; store extra glassware and materials as soon as you finish with them, keeping only essential materials on the workbench.

- Clean your work area every day;
- Clean hood areas and benches at the end of each session.
- Check that all reagents and waste containers are securely closed.
- Clean lab benches with sponges; rinse well and squeeze dry for the next user.
- Except as directed by a supervisor, dry a clean surface or wet hands with cotton towels. Air dry the towel and reuse.
- See [EMERGENCY RESPONSE](#) for instructions on cleaning hazardous spills.
- Ask for staff advice if you're unsure how to clean something.

Handle hazardous materials with correct techniques. Your TA may instruct you in these techniques as well:

- **Bottles, stoppers and caps.** Keep supply bottles and waste containers tightly capped at all times between uses. After removing material from a container, replace the cap immediately, making sure to use the correct cap. Bottle caps and stoppers can contaminate a workbench or hood surface. Hold the cap while pouring – ask your TA to demonstrate this technique. If the bottle is awkward or too large, place the cap on a watch glass or weighing paper.
- **Never touch hazardous chemicals with bare hands;** use tools such as tongs and scoops.

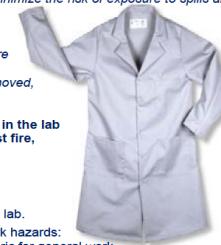
CHEMISTRY AND BIOCHEMISTRY UC San Diego

DOs & DON'Ts of Lab Coats . . .

Properly worn, a lab coat covers your clothes to minimize the risk of exposure to spills and aerosols.

It will also provide short-term protection from saturation by harmful substances and temporary protection against fire. Although, most lab coats are not designed to be impermeable to hazardous substances or flameproof, they can be quickly removed, isolating you from harmful exposures or flames.

To minimize exposures to harmful substances in the lab and provide some temporary protection against fire, follow these DOs and DON'Ts.



Wear your lab coat at all times when working in a lab.

Choose a lab coat based on the expected work hazards: a lab coat made of [cotton](#) (or cotton-blend) fabric for general work. Choose a [resistant fabric](#) (e.g., Nomex) if there is a significant fire potential. In hazardous areas, choose a coat that has [no openings](#) for access to pockets; promise the wearer's safety.

Choose a lab coat that covers the knees and has full-length sleeves. Ask for help if the coat is hard to fit.

Choose a lab coat that is completely "buttoned up." Snap closures are preferred over buttons to avoid a button popping out in an emergency.

Wear a lab coat if you are wet, contaminated or on fire. Wear a protective apron (rubber or coated fabric) when there is a significant chance of contact with corrosive materials or when working from a seated position (as in a lab).

Wash lab coats clean. If contaminated with hazardous material, coat will be cleaned on site or disposed as a hazardous waste. Once decontaminated, coats should be separated from general laundry. For general dirt, separate from general laundry and wash frequently.

Do not wear a lab coat made of synthetic fabric that can melt/burn to work in a fire hazard area. Lab coats can shrink and stick to skin.

Do not wear lab coats unbuttoned. An open lab coat is an invitation for hazardous exposures.

Do not wear sleeves on lab coats or allow shirt/sweater sleeves to protrude. Do not wear lab coats outside the lab area or into a food area (even if it's clean). Do not store lab coats in a closed plastic bag.

Adapted from materials produced by: Risk Management & Safety



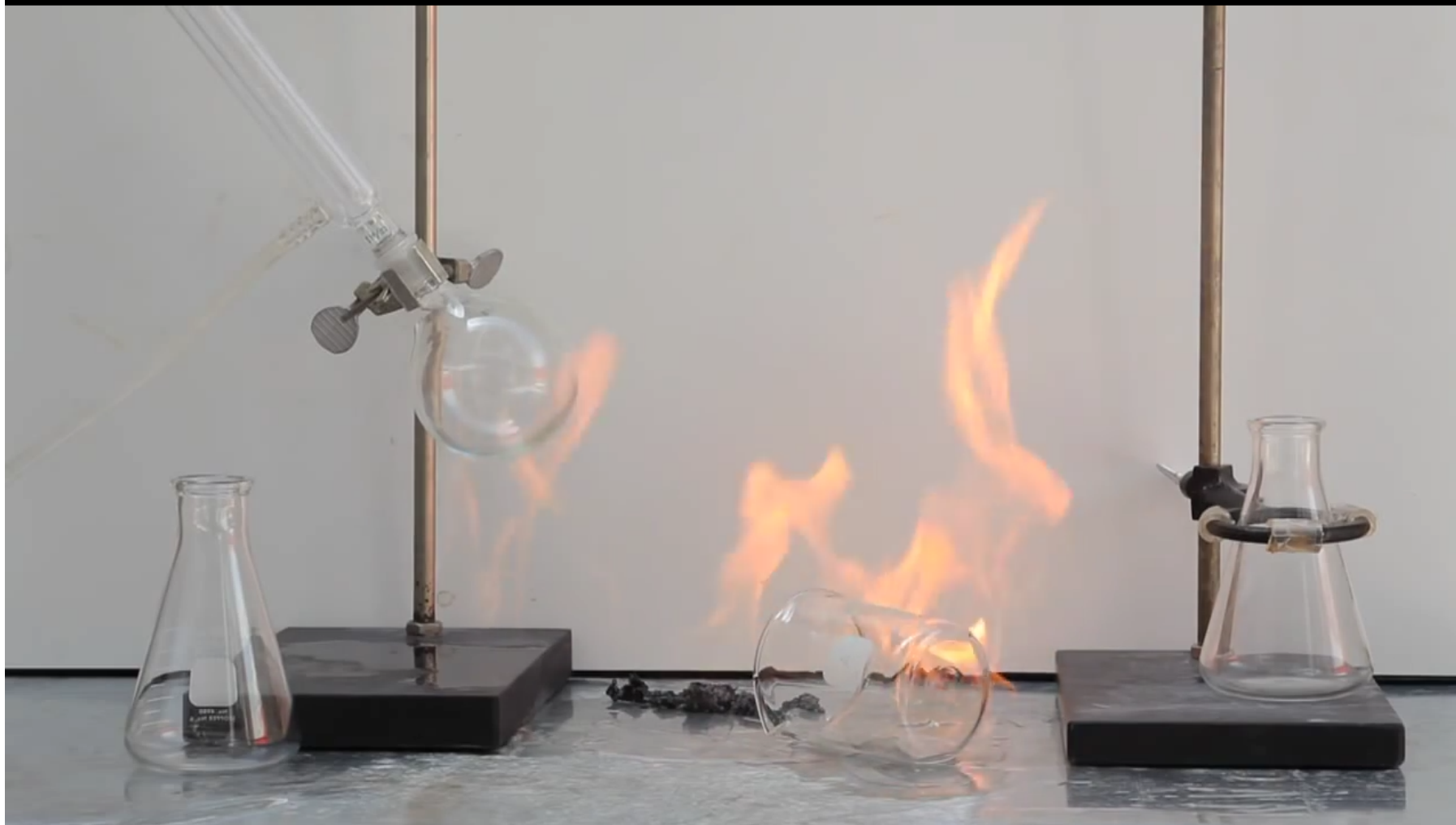
Stay Protected



▶ ⏮ 🔊 0:20 / 1:04



To be (Safe) or not to be



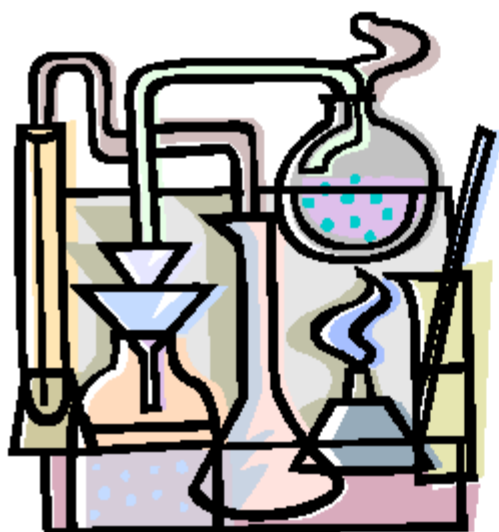
▶ ⏮ 🔊 3:41 / 8:46





SAFETY WORKSHOP

NSB 1103



- ❖ SIGN IN & MEET STAFF
- ❖ PICK UP A WORKSHEET
- ❖ READ SIGNS @ STATIONS
- ❖ READ / OBSERVE / ASK QUESTIONS
- ❖ COMPLETE WORKSHEET
- ❖ ASK MORE QUESTIONS
- ❖ SUGGEST IMPROVEMENTS TO WORKSHOP



GOGGLES & GLASSES

eye protection for everyone

SAFETY EYEWEAR is required for everyone whenever **working** in working with glassware or chemicals – including check-in, check-out & dishwashing.

Purchase eyewear at Bookstore – Stockroom does not sell or lend.

Contact lenses may be worn **with** safety eyewear.

CONSIDER the items labeled

"DO NOT USE IN LAB"
If you don't see **with** these items are not allowed, ask a staff member.

In **CHEM 71 & 141B**, goggles are the only eye protection permitted (TA, students & visitors).

In **other classes**, students (under the guidance of instructor and TA) decide whether goggles are needed or if safety glasses are sufficient.

Safety glasses can be more comfortable and easier to wear. Goggles are required when there is a risk of an eye-hazardous splash or spill.



GOGGLES CONTACT THE FACE ALL AROUND, ESPECIALLY OVER THE EYES AND HAVE INDIRECT VENTING (NO HOLES) WHILE PROVIDING THE ABSOLUTE MINIMUM OF STYLE.

SAFETY GLASSES ALLOW MORE AIR CIRCULATION, BUT DO NOT PROTECT AGAINST SPLASH HAZARDS. DARK LENSES ARE NOT PERMITTED IN LABS.

Egg causes discomfort & blurred vision for some workers – anti-fog lens cleaner is available in the Stockroom.



FACE SHIELD

- protects face & some of neck
- for extra protection from splash
- rarely needed in CHEM Teaching Labs



SAFETY GOGGLES
(CHEMICAL SPLASH GOGGLES)

Do Not Use

Do Not Use

GOGGLES & GLASSES

eye protection for everyone

SAFETY EYEWEAR is required for everyone whenever anyone is working with glassware or chemicals – including check-in, check-out & dishwashing.

Purchase eyewear at Bookstore – Stockroom does not sell or lend.

Contact lenses may be worn with safety eyewear.

CONSIDER the items labeled

“DO NOT USE IN LAB”

If you don't see why these items are not allowed, ask a staff member.

In CHEM 7L & 143A, **goggles** are the only eye protection permitted (TA, students & visitors).

In other classes, students (under the guidance of Instructor and TA) decide whether **goggles** are needed or if **safety glasses** are sufficient.

Safety glasses can be more comfortable and easier to wear. Goggles are required when there is a risk of an eye-hazardous splash or spill. sss



GOGGLES CONTACT THE FACE ALL AROUND, ESPECIALLY OVER THE EYES AND HAVE INDIRECT VENTING (NO HOLES) WHILE PROVIDING THE ABSOLUTE MINIMUM OF STYLE.

In what room does your lab class meet?

Where is the evacuation assembly location for YOUR LAB CLASS?

York _____

NSB _____

Each lab will be different. Draw a plan of this lab room. Use symbols to show the following items; if item is not present, say so.

Doors: location & direction of opening



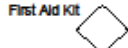
Chemical hood



Telephone, if any [T]

Safety shower-eyewash station

First Aid Kit



Fire Blanket

FIRE

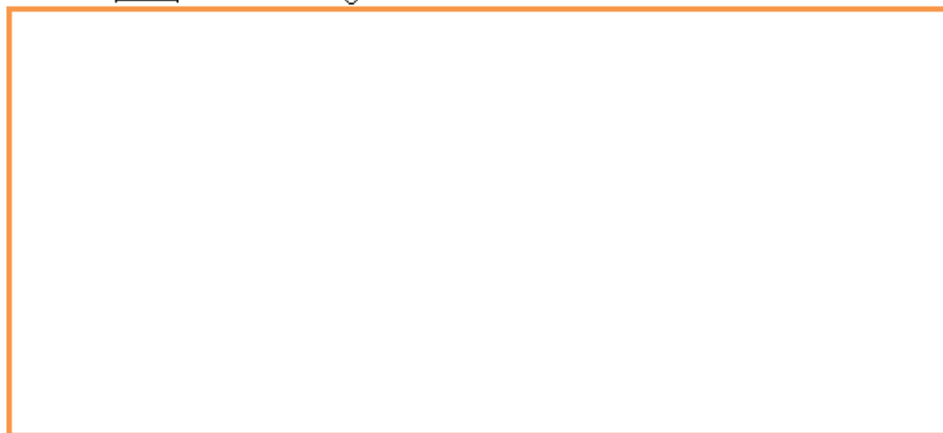
Spill Kit

SPILL

Broken Glass Box

G

Waste Collection Area



PERSONAL PROTECTIVE EQUIPMENT

What differences can be seen between safety glasses and splash goggles?

For what activity are goggles always needed?

What is the minimum personal protection necessary to work in the teaching labs?

Is a Lab Supervisor (Instructor) permitted to make a safety rule which is stricter than a campus safety rule?

When should you wear protective gloves in lab?

Give an example of an activity where safety glasses would be appropriate, if permitted.

What might happen to a student who arrives unprepared or inappropriately equipped for a lab class?

Do hazardous chemicals used at home or in a hobby shop require protective measures? Gloves? Glasses or goggles? Sturdy shoes? Why/why not?

LABORATORY PRACTICES

Why are ALL food, drink, chewing gum, and smoking materials prohibited in the labs?

What difference can be seen between hot (100C or 212F) and room-temperature (20C or 68F) glass?

To avoid a burn, you wish to check the temperature of an oven-dried beaker. Which technique(s) will be useful?

- look at the appearance
- grab the glass
- ask TA
- hold hand near glass
- look for condensation
- none of the above



SAFETY WORKSHOP

NSB 1103



- ❖ SIGN IN & MEET STAFF
- ❖ PICK UP A WORKSHEET
- ❖ READ SIGNS @ STATIONS
- ❖ READ / OBSERVE / ASK QUESTIONS
- ❖ COMPLETE WORKSHEET
- ❖ ASK MORE QUESTIONS
- ❖ SUGGEST IMPROVEMENTS TO WORKSHOP

