

Welcome to the Hard Hat Training Series!



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PRESENTATION HERE

* 1 2 3 4 5 6d 7d 8d 9d 10d 11d 12d																5 B 10.811		12.011		14.0067		15 P 30.97376		16 S 32.066		17 Cl 35.453		18 Ar 39.948																			
1 H 1.00794																13 Al 26.98154		14 Si 28.0855†		32 Ge 72.59†		33 As 74.9216		34 Se 78.96†		35 Br 79.904		36 Kr 83.80																			
3 Li 6.941†																25 Mn 54.9380		26 Fe 55.847†		27 Co 58.9332		28 Ni 58.69		29 Cu 63.546†		30 Zn 65.39*		31 Ga 69.723		49 In 114.82		50 Sn 118.710		51 Sb 121.75†		52 Te 127.60†		53 I 126.9045		54 Xe 131.29†							
11 Na 22.98977																23 V 50.9415		24 Cr 51.9961		43 Tc (98)		44 Ru 101.07*		45 Rh 102.9055		46 Pd 106.42		47 Ag 107.8682†		48 Cd 112.41		81 Tl 204.383		82 Pb 207.2		83 Bi 208.9804		84 Po (209)		85 At (210)		86 Rn (222)					
19 K 39.0983																20 Ca 40.078		21 Sc 44.95591		22 Ti 47.88†		40 Zr 91.224†		41 Nb 92.9064		42 Mo 95.94		74 W 183.85†		75 Re 186.207		76 Os 190.2		77 Ir 192.22†		78 Pt 195.08†		79 Au 196.9665		80 Hg 200.59†		110 Ds (271)		111 (272)			
37 Rb 85.4678†																38 Sr 87.62		39 Y 88.9059		55 Cs 132.9054		56 Ba 137.33		57 La 138.9055†		72 Hf 178.49†		73 Ta 180.9479		104 Rf 261.11		105 Db 262.114		106 Sg 263.118		107 Bh 262.12		108 Hs (265)		109 Mt (266)		110 Ds (271)		111 (272)			
58 Ce 140.12																59 Pr 140.9077		60 Nd 144.24†		61 Pm (145)		62 Sm 150.36†		63 Eu 151.96		64 Gd 157.25†		65 Tb 158.9254		66 Dy 162.50†		67 Ho 164.9304		68 Er 167.26†		69 Tm 168.9342		70 Yb 173.04†		71 Lu 174.967							
87 Fr (223)																88 Ra 226.0254		89 Ac 227.077		90 Th 232.0377		91 Pa 231.03688		92 U 238.02891		93 Np 237.04817		94 Pu 244.06422		95 Am 243.06138		96 Cm 247.07035		97 Bk 247.07035		98 Cf 251.07958		99 Es 252.08385		100 Fm 257.10528		101 Md 258.10528		102 No 259.10528		103 Lr 262.10528	

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* These weights are considered reliable to ±2 in the last place.
† These weights are considered reliable to ±3 in the last place.
‡ These weights are considered reliable in the last place, as follows: Calcium and Gallium ±4; Boron ±5; Chromium and Sulfur ±6; hydrogen and Tin ±7.
§ All other weights are reliable to ±1 in the last place. All reliabilities are based on an uncertainty scale of ±1 × 10⁻ⁿ.

• Current IUPAC
◆ Current ACS

Welcome to the Hard Hat Training Series. Today, you will learn about the important principles regarding lab safety. We will strive to provide information that will increase your knowledge and make you a better and safer worker.



Sheri, a student at the University of California Los Angeles (UCLA), was working as a laboratory research assistant while completing her bachelor's degree in chemistry. One day, as she was transferring a highly reactive chemical in the lab, some of it sprayed her hands and synthetic sweater and suddenly ignited. Despite being immediately taken to Intensive Care at the hospital, Sheri had already sustained third-degree burns to over 40% of her body. After 18 days in the hospital, she died from her injuries.

While obviously an extreme case, Sheri's tragic death is far from an isolated incident. Across the United States, over 500,000 people are employed in laboratories. Every day, lab workers are exposed to numerous potential hazards of physical, chemical, biological, and radioactive varieties.



Despite the obviously hazardous nature of lab work, safety measures and precautions are too often ignored or not taken seriously. This results in dozens of injuries and deaths each year and unnecessary grief and stress for family members.

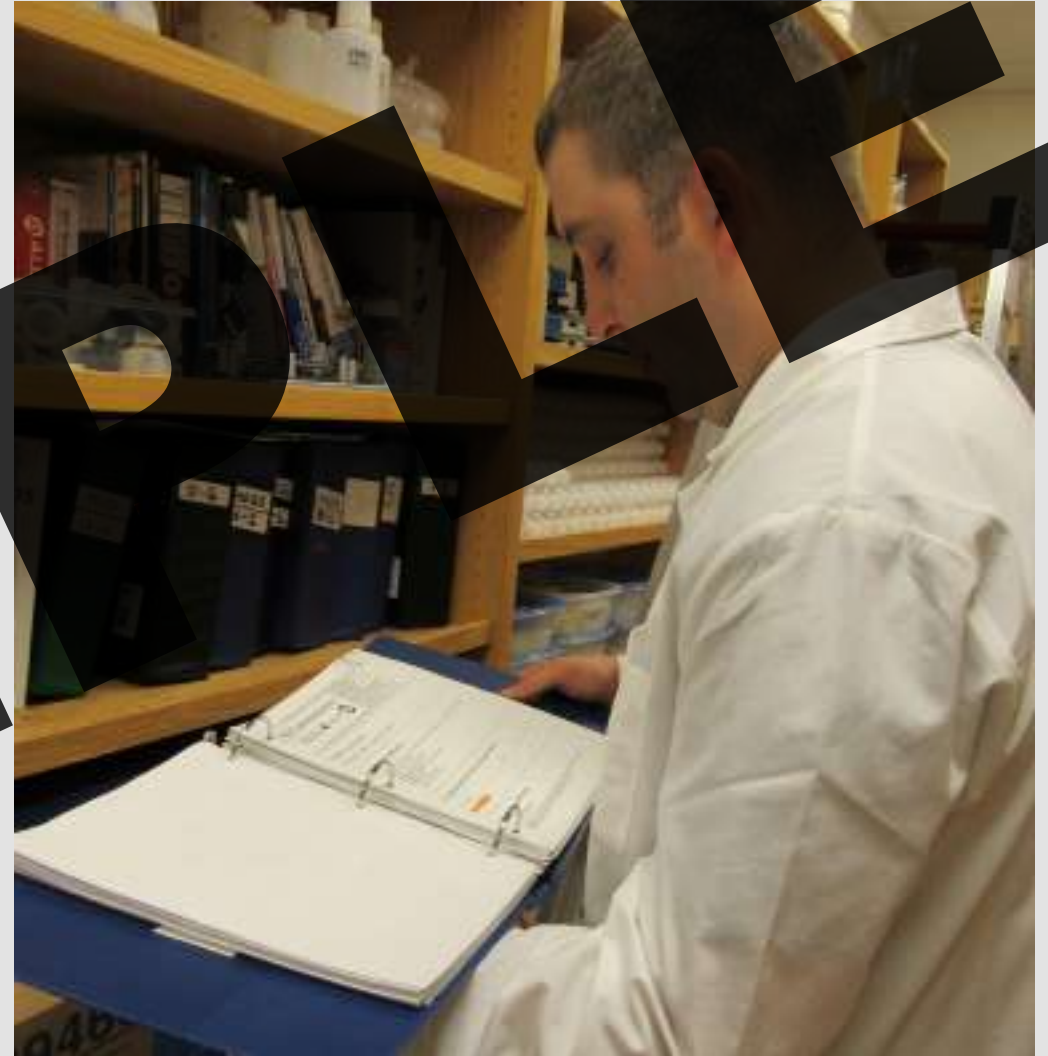


Because of the widespread disregard for regional and national laboratory regulations, it is more important than ever that we present a training that will equip you with the tools to keep yourself and your coworkers safe. The more trained professionals there are who willfully ignore the rules, the more dangerous your work environment becomes.



Helpful Terms

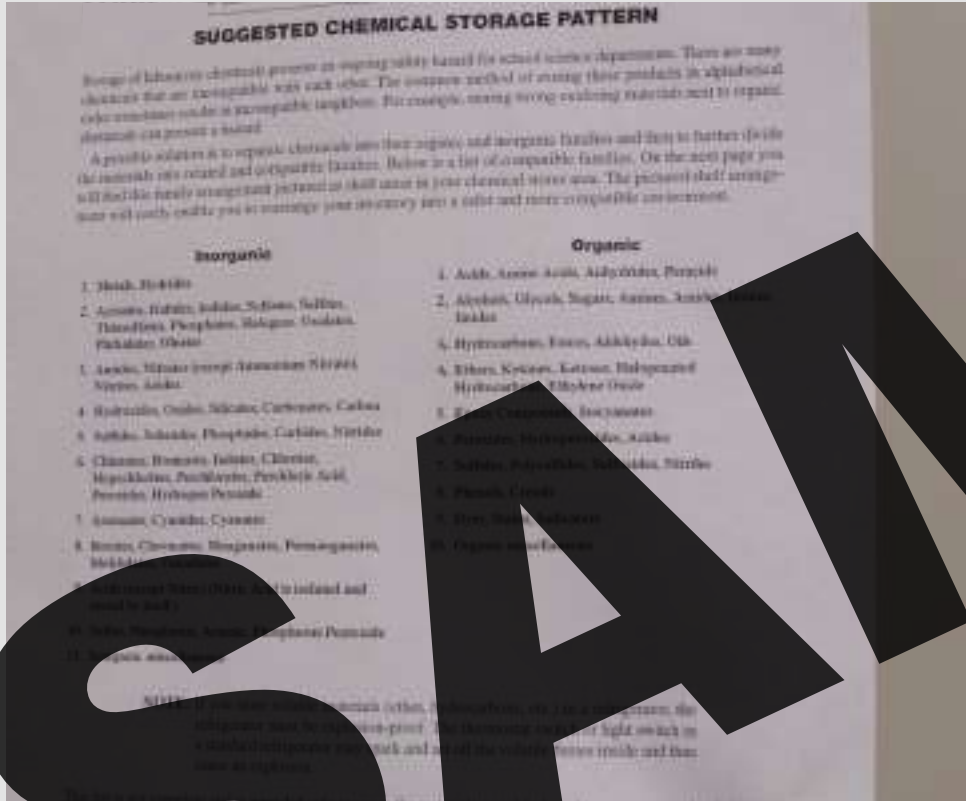
Before proceeding, let's take the time to define a few terms that will be helpful as you navigate the course. The first is **permissible exposure limit (PEL)**. This is the legal limit to which a worker can be exposed to a particular substance.



Regulated Areas: Areas that are marked off and designated by the employer where dangerous chemicals are or might be present. These zones should have appropriate warning signs. Only workers who have been properly trained should ever enter a regulated area.



Good Laboratory Practice: Refers to a quality system of management controls for research laboratories and organizations. This is meant to ensure uniformity and reliability in chemical non-clinical safety tests.



The **Office of Environmental Health & Safety (EHS)** is a branch of the U.S. Department of Energy in charge of regulating many industries' impacts on the environment and the health of citizens. To promote safer and more eco-friendly work practices, many EHS programs have been implemented at companies and managers appointed to ensure compliance.



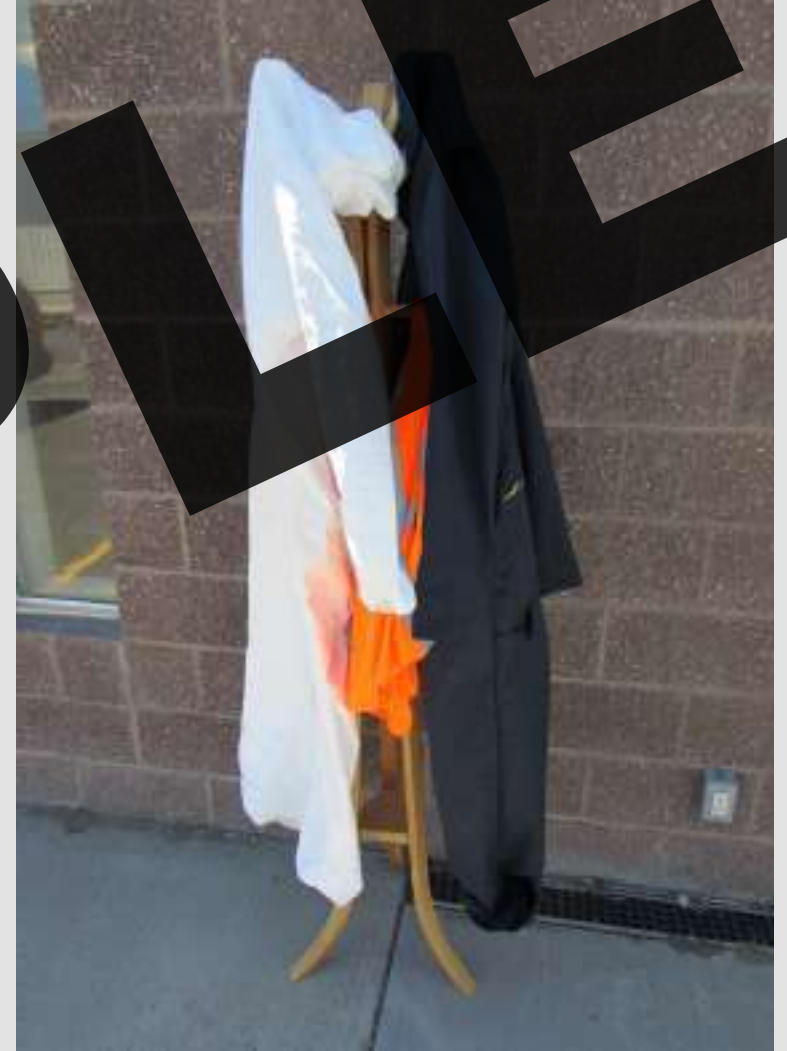


The **National Fire Protection Association** (NFPA) is a United States organization that creates and maintains private, copyrighted standards and codes that are adopted by local governments. Its primary purpose is to ensure fire safety in the workplace and eliminating death or injury by fire, electrocution, and so on.

Laboratory Standard: This is the general term used to refer to OSHA's standard 29 CFR 1910.1450. Labs that adhere to this standard are normally required to respect all regulations promoted by OSHA.

OSHA

The last term to become familiar with is **PPE (Personal Protective Equipment)**. This term refers to any equipment or gear used to help keep you safe.



HARD HAT
TRAINING SERIES

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LABORATORY SAFETY
AWARENESS TRAINING





These are some of the main standards concerning proper lab procedures. Many industries have additional standards, as do some states. It is your responsibility to know all federal, state/provincial, local, and company rules that apply to your equipment and jobsite.

Laboratories serve many different purposes that call for varying safeguards and skill sets. Listed to the right are some of the main types of labs found across the U.S.

Labs Across America

- Analytical and Quality
- Biosafety
- Cleanrooms
- Clinical and Medical
- Incubator
- Production
- Research and Development

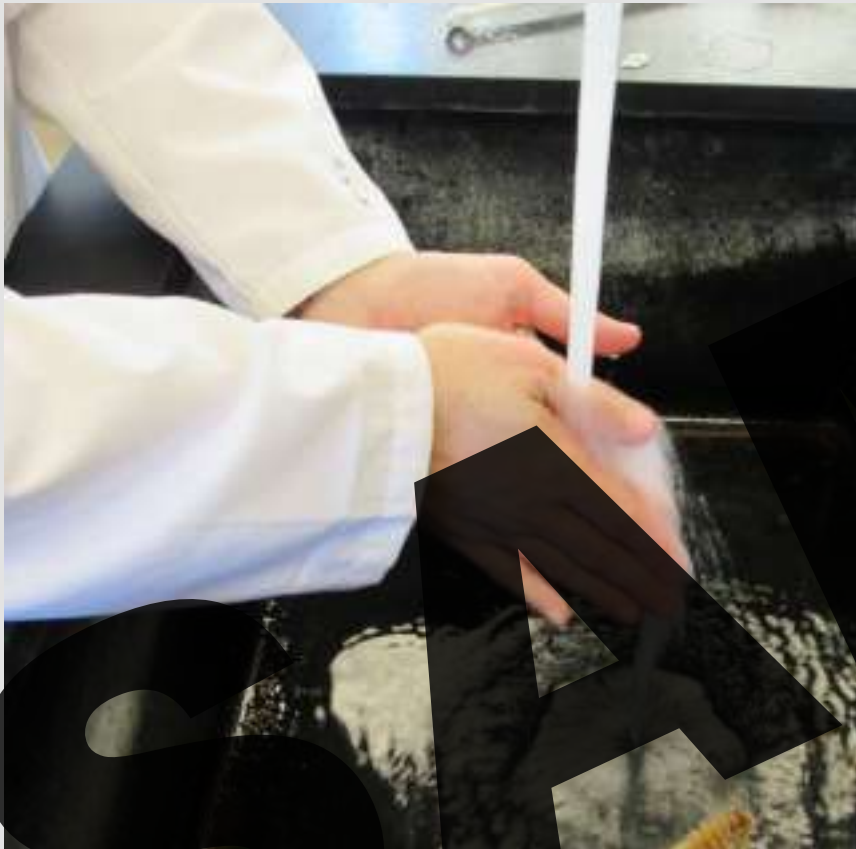


Because there are so many different lab types, we cannot cover all of them within the scope of this training. Instead, we offer guidance on general standards and procedures that can be applied on any worksite. It is your responsibility to make sure that you receive job specific training when using unfamiliar equipment or when asked to carry out a new task.

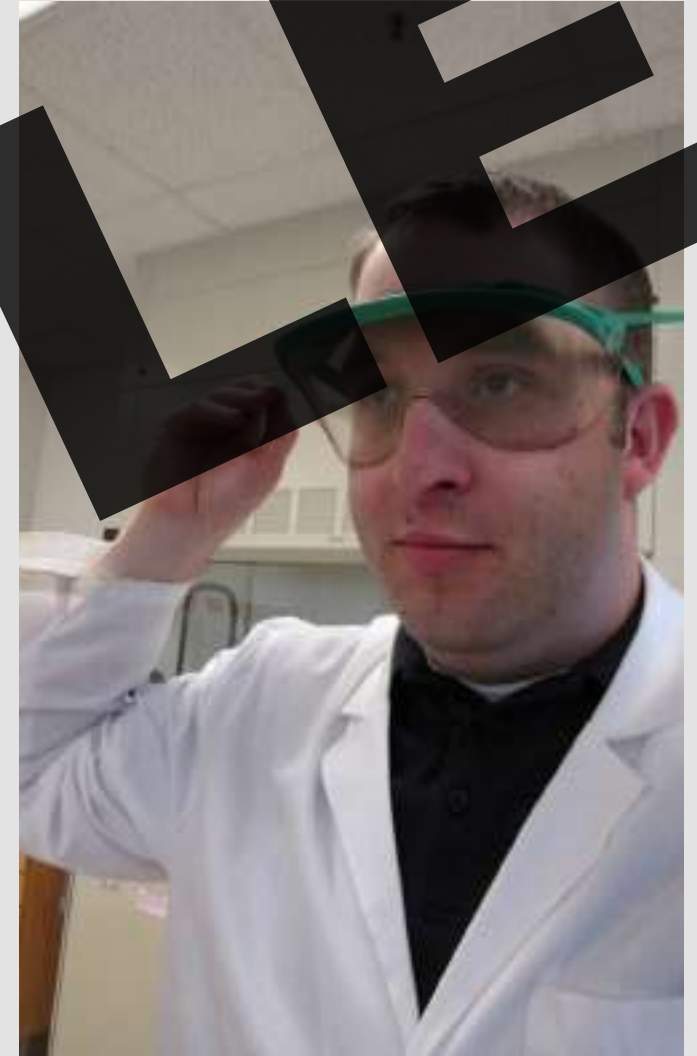
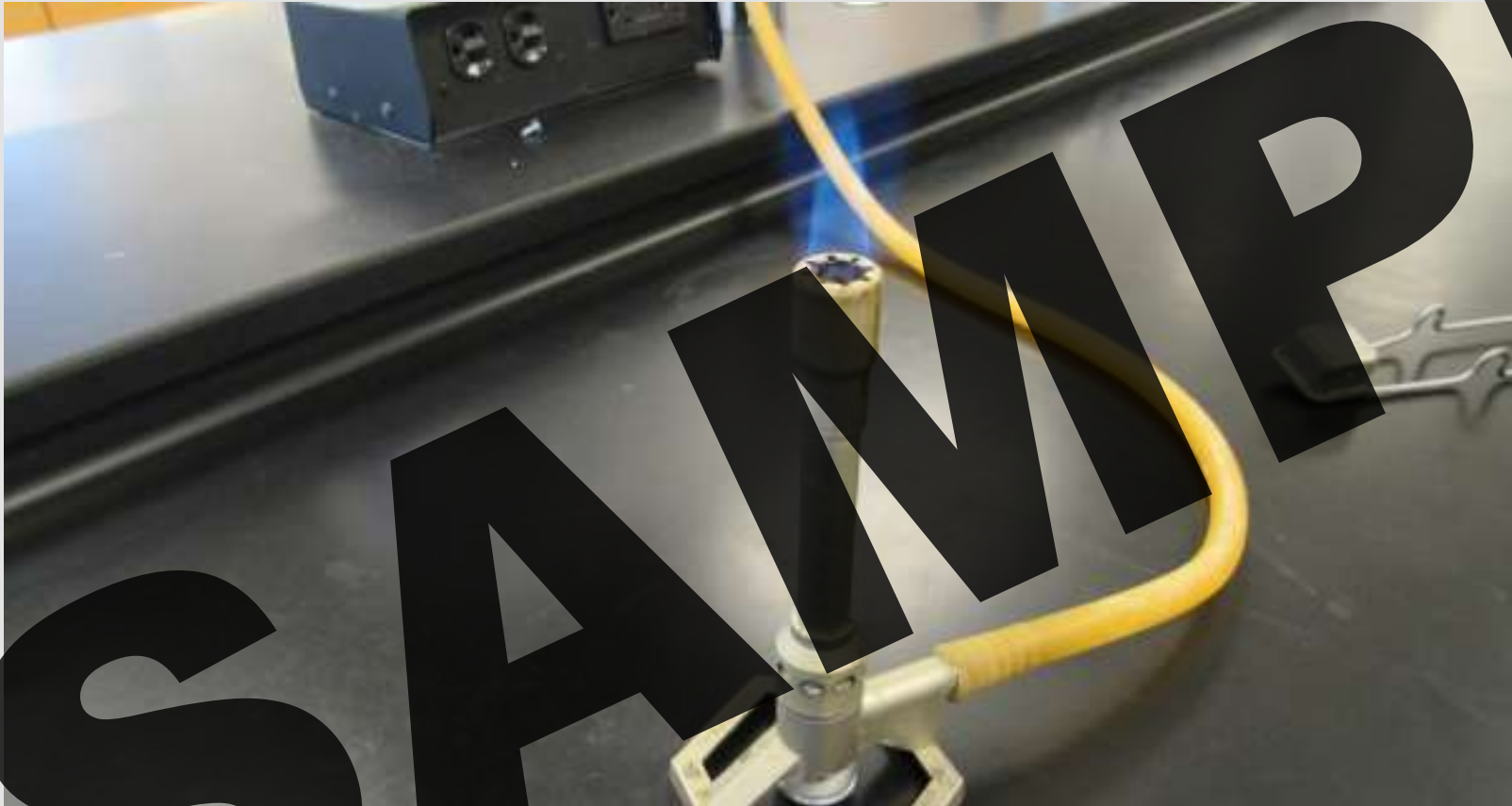
We will discuss identifying and mitigating some of the most common hazards within your workplace and what to do if things seem off.



We will also cover proper hygiene, storage, and dumping processes and issue warnings of the repercussions of sloppiness.



We will go over emergency protocol regarding PPE, injuries, fires in the worksite, and so on. In so doing, we aim to drive home the importance of safe practice at all times on the job. Your negligence doesn't only affect you; it has an impact on everyone around you, too.



No matter how many times you have carried out a certain task, there is never a point where it is safe to assume accidents can't happen. You and any of your coworkers can be educated enough to qualify for laboratory operations without being intelligent and careful enough to be trustworthy. Even if it seems inconvenient or bothersome to take extra precaution, you will never regret ensuring that your own safety is always the top priority.



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Hazard Identification

SAMPLE



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