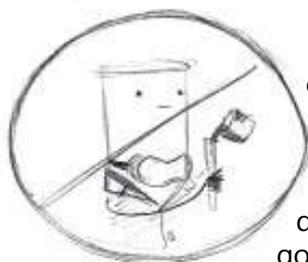


Lab Safety & Glassware

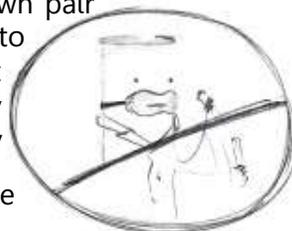


Safety is of utmost importance. The following rules must be followed by everyone working in the chemistry laboratories. Your instructor will discuss specific safety precautions relevant to each experiment during the pre-lab lecture. Please please please! consult with your instructor if you have questions regarding any safety precautions. Failure to observe laboratory safety rules and procedures may result in injury to yourself or to others. Students who do not follow safety rules (including proper attire) will be asked to leave the lab[⊗]. Repeat offenders may be dropped from the course at the instructor's discretion.

1. Appropriate lab attire: Appropriate protective clothing must be worn at all times while in the laboratory. Best not to wear your Sunday clothes to lab since many chemicals can stain, bleach or generate holes in your clothing. You have been warned!



a) Safety goggles approved by the chemistry department must be worn at all times, even if you are wearing prescription glasses. You are responsible for bringing your own pair of safety goggles to lab each week. Students who need to borrow safety goggles from the instructor will have one point deducted from their lab[⊗]. Students who fail to wear their safety goggles will have a point deducted. Students incessantly neglecting to wear protective goggles may be asked to leave the laboratory. Oh no!



b) Shirts must cover your entire upper torso (this includes your belly button). Shirts should be long enough to tuck inside your pants. Tank tops, leotards, blouses and tops made of sheer material are not allowed. Sorry, this includes bikinis[⊗]. Polyester will dissolve in many chemical solvents. Whoa!



c) Pants or skirts must be at least knee length. Tight slacks or jeans, stirrup pants and tights, and (sigh) pjs are not recommended. Let's think about why, shall we?

d) Shoes must be flat-soled and cover the entire foot. Sandals, slippers open-toe shoes, and high-heels are not permitted. [⊗] If you are trying to get your lab partner's phone number, use your intelligence rather than your legs this time. A burn on the delicate skin atop your foot really does hurt. Cover your feet! Please wear socks! Please. It is for your own protection. Please.

e) Long hair and billowy clothing must be tied back while working in the lab. Burnt or chemical soaked hair is not very attractive.

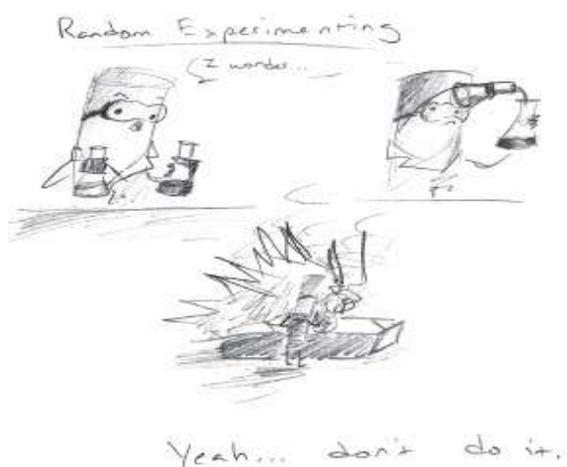


LAB SAFETY & ETIQUETTE

2. **Never Ever Eat or Drink or Chew Gum in Lab:** Honestly, do you want to be chewing on that smelly stuff in your beaker? Leave water bottles in your bag. Coffee should be left by the entrance (or finished before entering lab). Why? Imagine picking up the wrong cup and drinking some hydrochloric acid? Or splashing some aqua regia (acid mix) in your coffee. Not very tasty even by the light of a Bunsen burner. And the chewing gum thing, nasty.



3. **Wash your hands!** after every experiment!! Egad! Can you imagine not doing this one? Hello!



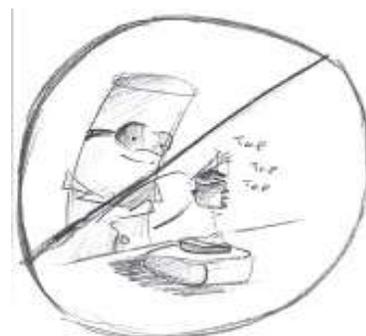
4. Never ever work unsupervised in lab!

Working in lab without an instructor present is forbidden! Horrible things will happen! Simply dreadfully horrible!! Students may only work in the laboratories during regularly scheduled lab periods and then only when supervised by a member of the faculty.

5. Never ever perform unauthorized experiments!

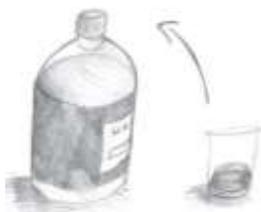
If you have an idea for improving an experiment or for a new experiment, consult with your instructor. We love innovative ideas ☺.

6. **Never ever weigh chemicals directly on a balance** ☹️. What a mess! Place an empty container or weighing paper on the scale and zero ("tare"). Then add chemical to the container or paper to mass. Balances are expensive! Clean spills immediately. Clean up your own mess. Do you still make your mom clean up after you? Geez.



7. **Fume hoods** should be used when performing experiments that generate an objectionable gas. PU! (And not talking about plutonium here.) The lab will indicate when steps must be performed in the fume hoods. Fume hoods are located in the front of the lab. Please read and follow directions. Please read. Really, just read, please.

8. **Never ever flush chemical waste down the drain!** Unless specifically approved by your instructor. Read instructions!



Dispose chemical waste in designated containers.

Waste containers are labeled in fume hood for each and every experiment. **Read labels!** Disposing waste in the wrong container can generate an unexpected chemical reaction. Read labels. Please, read labels. Gnomes read labels.



9. Never ever smell / taste anything in lab (OMG!)

Many chemicals are poisons. Waft to detect odor.



10. Read the label on all chemical bottles and waste bottles. If you use the wrong chemical, you may have an unwanted chemical reaction and even an explosion☹. If unsure, consult with your instructor. Do people really use chemicals without reading the label? Wow, this is scaring me that I keep repeating myself to read labels.

11. Never ever take chemical bottles to your lab bench unless directed by your instructor. Pour the approximate amount you need from the bottle into a small container and take this to your bench. Please respect you are not the only student in lab! Respect the golden rule and share☺.



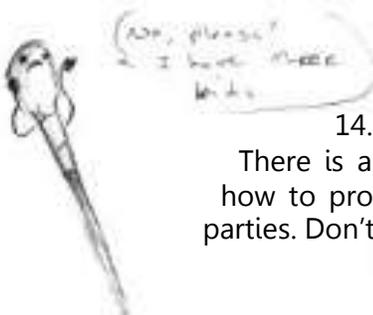
12. Never ever pour chemicals on your hand!

Use a metal scoopula (aka, spatula) to transfer solid chemicals. The fact that this is a safety rule means I've actually witnessed this, more than once, in lab. Touching chemicals could expose you to unfathomable hazards plus contaminate the container.



13. Never ever add water to concentrated acids or bases.

To dilute, always add acid or base slowly into water. The excessive heat generated from diluting concentrated acid or base can cause the solution to splatter and shatter the glass. This is an extremely exothermic reaction and shattered glass by acid would burn even a Jedi.



14. Never ever return excess reagent to the original bottle.

There is always a chance of contaminating the original sample. Ask your instructor how to properly dispose of excess chemicals. This is like the double dipping rule at parties. Don't be a double dipper in lab.

15. Never ever put pipets in reagent/stock bottles.

Yep, another double dipping contamination rule. While we are talking about pipets, **Never ever mouth pipet!** Egad!



16. **Never ever leave chemical bottles open.** Many chemicals are photosensitive (light photons decompose many compounds) or hygroscopic (a compound that absorbs water easily, becoming bloated and turning into a great white shark). Replace lids as soon as you are finished dispensing the material. Are you one of those people who doesn't put the lid back on the ketchup bottle? Geez, that really drives me crazy.



17. **Clean up spills immediately!** and dispose of the spilled material properly. Check with your instructor on the proper way to clean a spill. Do you leave a mess for others to clean? Your mom doesn't work here, and if she did, she'd also make you clean up your own mess!



18. **Chipped, cracked, or broken glassware** should be thrown in the special glass waste container. Never ever throw broken glass in the regular garbage. Never ever return broken/chipped/cracked glassware to your glassware drawer for the next person to clean up or cut their fingers on (Egad! Then it would be bloody broken glassware). Report broken glassware to your instructor so that s/he may replace it. You will not be charged for breakage, but glass does not usually bounce well.



19. **Hot objects burn!** Yep, they really do. Use tongs or hot pads to pick up hot objects rather than your delicate fingers (unless you are a Jedi of course). Never ever put hot glass in cold water as it will crack (unless again you are a Jedi). Allow heated glass sufficient time to cool. You would not believe how many students burn themselves each term. Do not test if the glass is cool with your tongue, either. That is nasty.

20. **Report all injuries and accidents,** no matter how minor, to your instructor immediately. Know the location of the fire extinguishers, fire blankets, safety showers, and eyewash stations. Familiarize yourself with two different exits from the lab (hint: look for a door).



A note of recognition: All the test tube toons in this lab intro and in all the labs are the product of the refreshingly creative intellect of Christina Crisan, an MHCC student who aspires to be a hobo. All the labs and stories, every single typed word, came from the nebulous neuronal connections of Dr. Joyce Sherpa's brain, who aspires to be an auraromatic alchemist or a fairy godmother or perhaps a hobo with Christina.

Any reproduction or use of these words or toons without both of our consent is illegal. They are our intellectual property, please respect that. If you are inspired by them, tell us☺.

Learn your Glassware!



AmBIGuous **Beaker**; Testy **Test Tube** (T^3); **Graduated Cylinder**, p.H.D.; flamboyant **Flask**; stealth **Stir Rod**
 Descriptions of the Big 5 glassware are on the next page. Learn them, you will use them! Learn them!!



Volumetric Flask (very precise, a bit anal); **Pipet** (plastic, but very very helpful); **Watch Glass** vaporizer

These not so Big 5 glassware will be introduced in more detail as we use them in lab; in fact some didn't even show up for this photo shoot, probably why they didn't make the cut to be part of the Big 5.

CHEAT CODES To a Better Chemistry Experience

[Learn these! You're using 'em in lab a lot!]

Common Glassware

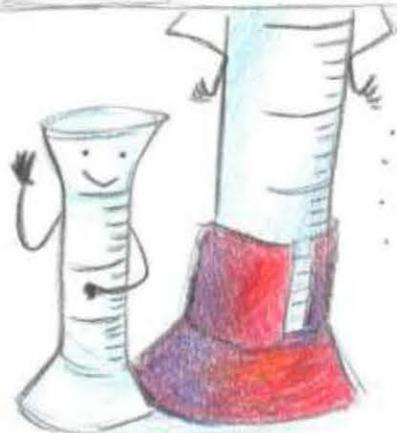
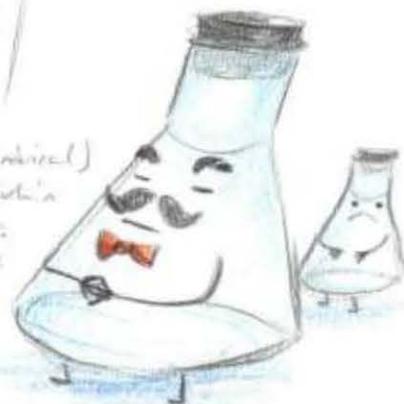
- Cylindrical 
- Multiple sizes, same shape
- Sucks as a measuring device. (Imprecise)
- Flunked most class in high school.
- May or may not dream of being a sumo wrestler



Beaker

- Not in the "in" crowd (not cylindrical)
- Need to imprison something within a glass enclosure? Look no further.
- Think it's the one thing keeping the lab on track.
- The children are lonely. So lonely.

Erlenmeyer Flask

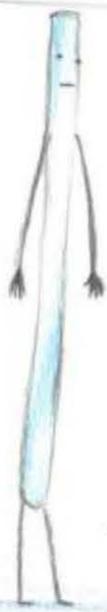
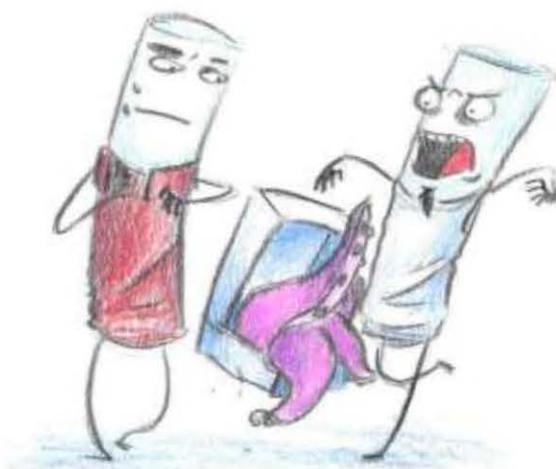


- Likes measuring things
- And math
- Merit's great
- Praise to the meniscus!

Graduated "Precise" Cylinder

- Cylindrical! 
- Multiple sizes, all have round bottoms 
- Does all the grunt work
- Isn't paid enough for this

Test Tube



Glass Stirring Rod

- Practically invisible
- Doesn't sag much
- Does a lot of important stuff, but most either don't notice or forget about 3 seconds after it happens.
- Has a cousin who has an awesome hat



Rubber policeman,
the rarer,
more noticeable
cousin

