

WHY IS LAB SAFETY IMPORTANT?

- Lab safety is a major aspect of every lab based science class / research.
- Lab safety rules and symbols are needed so that students do not injure themselves or their classmates.
- Safe working protects:
 - You
 - Other lab workers
 - Cleaners
 - Visitors
 - Your work

WHAT ARE THE GENERAL HAZARDS IN A LABORATORY?

- ◉ Fire
- ◉ Breakage of glassware
- ◉ Sharps
- ◉ Spillages
- ◉ Pressure equipment & gas cylinders
- ◉ Extremes of heat & cold
- ◉ Chemical hazards
- ◉ Biological hazards
- ◉ Radiation

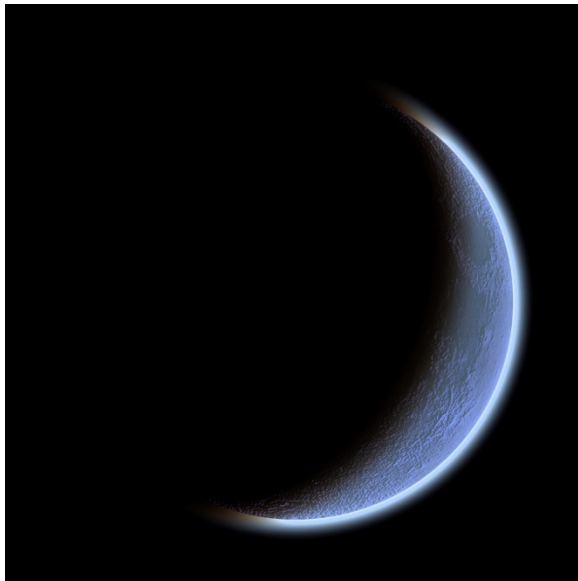


And many more!

LAB SAFETY RULES

- Always follow the measurement procedures and only do lab work when an assistant or laboratory technician is present.
- Conduct yourself in a responsible manner at all times. No Horseplay!
- Do not eat food, drink beverages, or chew gum in the lab. Do not use lab glassware as food or beverage containers.
- Report ALL accidents to your supervisor and laboratory administrators immediately, even if you think it is minor.

WORKING OUTSIDE NORMAL HOURS AND AT WEEKENDS



- You will need to attend training courses and have permission from your Head of Department before working outside normal hours
- Most experimental work is not permitted
- Your supervisor will explain the requirements in more detail

LAB SAFETY RULES

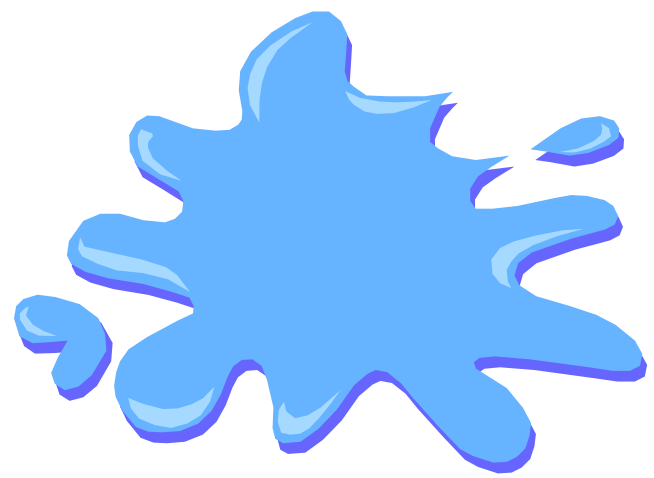
- There are many different types of protective glove
- Use the correct ones for the job you will be doing
- Remember that you need to select chemical protection gloves according to the materials and/or substances with which you will be working
- Remove your gloves before using instruments, telephone, and leaving the laboratory
- Think about what you touch with gloved hands. Are you potentially contaminating a surface?

LAB SAFETY RULES

- ◉ Comply with emergency evacuation procedures
- ◉ Keep aisles clear at all times
- ◉ Keep work area neat and clean – stools under table when not in use
- ◉ Dispose of trash and lab waste properly
- ◉ Keep hands away from eyes, mouth and body while using chemicals.
- ◉ Wash your hands with soap and water after all lab activities.
- ◉ NEVER touch, taste or smell any lab chemicals.

LAB SAFETY RULES

- ◉ Use correct techniques for the insertion of tubing onto glassware
- ◉ Never use glassware under pressure or vacuum unless it is designed for the job and suitably shielded
- ◉ Dispose of chipped or broken glassware – it is a risk to you and others
- ◉ Always dispose of broken glass in a glass bin or sharps bin and not in a general waste bin



- Clear up spillage promptly
- You will already have determined how to do this as part of your risk assessment
- Dispose of any hazardous material as toxic waste

Messy workers are usually poor workers!!

- Always do a visual check on electrical equipment before use, looking for obvious wear or defects
- All portable electrical equipment must have a current “PAT test” sticker
- **NEVER** use defective equipment

- Never mouth-pipette
- Always dilute concentrated acids by adding the acid to water, never the reverse
- Never carry Winchesters by the neck – always use a carrier
- Always leave benches, balances etc clean & tidy after use

- Keep your workplace tidy
- Clear up waste, deal with washing up and put things away as you finish with them
- Make sure everything is safe before you leave things unattended
- A tidy laboratory avoids accidents to everyone



LAB SAFETY RULES

- ◉ Do not touch chemicals or other materials until you are instructed to do so (very important)
- ◉ Never use any laboratory equipment unless you are trained & have been authorised to do so. As well as injuring yourself you may cause very costly damage
- ◉ Stay focused and follow protocol

WHEN IN DOUBT - ASK!!!

- ◉ Do not carry out a new or unfamiliar procedure until you have been fully trained & understand the precautions necessary for safe working

◉ **DO NOT GUESS!!!!**



HOW DO TOXIC MATERIALS ENTER THE BODY?

- ◉ By mouth (contaminated fingers!)
- ◉ By breathing in gases, aerosols or powder
- ◉ By skin contact or damage
- ◉ By absorption through intact skin
- ◉ By splashes into the eyes



CLOTHING

Wear:

- **Goggles/safety glasses**
- **Closed-toed shoes**
- **Clothing made of natural based fiber such as cotton**
- **Tie back long hair**

Do NOT Wear:

- **Sandals**
- **Jewelry**
- **Loose or Baggy clothing**

You are NOT allowed in the laboratory without proper attire!!!!!!

CLOTHING

Minimum Acceptable Lab Attire:

- **Lab coat**
- **Safety Glasses/Goggles**
- **Gloves**
- **Closed Shoes**

You are NOT allowed in the laboratory without proper attire!!!!!!

LAB SAFETY EQUIPMENT

Safety Shower



Eye Wash



Safety Goggles



LAB SAFETY EQUIPMENT

Eyewash

- Required if corrosives are used in lab
- Flush for 15 full minutes
- Eye injuries are easily prevented by wearing the proper safety goggles at all times during lab.

LAB SAFETY EQUIPMENT

Safety Shower

- Required if body splash with corrosives is possible
- Flush for a full 15 minutes
- Remove clothing under shower

LAB SAFETY EQUIPMENT

Cuts and Abrasions

- Always notify your supervisor and laboratory administrators immediately.
- A first aid kit is available in all of the lab rooms.
- Cleanse wound using soap and water.
If you are bleeding, firmly hold a sterile pad over the wound until it stops.

LAB SAFETY EQUIPMENT

Fire
Extinguisher



Fume Hood



LAB SAFETY EQUIPMENT







Fume Hood Do's & Don'ts

- Make sure hood is operating before using
- Perform all work > 15 cm into hood
- Elevate large objects above hood deck
- Keep your head outside hood
- Don't use hood for *excessive storage*
- Follow instructions for sash position
- Avoid rapid movements around hood

MATERIALS

- ◉ Obtain the **minimum** amounts needed for your work
- ◉ Ensure that all containers are clearly **labelled** with their contents and a hazard label
- ◉ Toxic materials must be **locked away**
- ◉ Corrosive substances must be stored securely at a low level in **bunded trays**
- ◉ Keep flammable materials in **specially designed cupboards**
- ◉ Store acids, bases & solvents separately

LAB SAFETY SYMBOLS FOUND IN YOUR TEXTBOOK

- ◉ Glassware 
- ◉ Heat 
- ◉ Eye and Face 
- ◉ Sharps 
- ◉ Electrical 
- ◉ Animal 
- ◉ Chemical 
- ◉ Fire 

OTHER CHEMICAL HAZARDS AND SYMBOLS

◉ Flammable



◉ Irritant



◉ Explosive



◉ Corrosive



◉ Toxic/Poison



◉ Environmental



CHEMICAL HAZARD SYMBOLS AND DEFINITIONS



- **Flammable** – Any substance that will burn if exposed to an open flame.



- **Explosive** – A substance that may explode if exposed to heat or flame.

CHEMICAL HAZARD SYMBOLS AND DEFINITIONS



- ◉ **Toxic/Poison** – A substance that can lead to death if inhaled, ingested, or absorbed by the skin.



- ◉ **Corrosive** – A substance that can destroy or burn living tissue and can eat away at other materials.

CHEMICAL HAZARD SYMBOLS AND DEFINITIONS



- **Irritant** - A substance that causes inflammation upon contact with skin or mucous membranes.



- **Environmental** - Substances that are harmful to the environment. They must be disposed of properly, not washed down the drain.

ACCIDENTS AND INJURIES

- Report **ALL** accidents and injuries to your supervisor and laboratory administrators immediately!!!
- Be aware of safety hazards associated with each chemical you use.
- Eye accident – Wash the eye with copious amounts of water for at least 15 min.
- Fire Burns – Stop, Drop, and be covered with a fire blanket or soaked with water. Do not remove clothing stuck to victim. Get medical attention immediately.

WASTE DISPOSAL

- ⦿ First ask your supervisor where/how to dispose of waste.
- ⦿ Never pour anything down the drain unless you are told to do so.
- ⦿ A waste bottle will be supplied for substance that cannot go down the drain

REASONS FOR PROPER WASTE DISPOSAL

- ⦿ Hazardous chemicals down the drain can lead to pollution of ground water, lakes, rivers, etc.
- ⦿ Plants and animals will die if they are exposed to hazardous chemical waste.
- ⦿ Serious health problems will become present in people if hazardous waste finds its way into drinking water.

- L -- Label everything clearly
- A -- Appropriate containers in good condition
- B -- *Be* neat and orderly

- S -- Store only what you will use
- A -- Always wear protective clothing
- F -- Food allowed in eating areas only
- E -- Everything in its place on a shelf
- T -- Time to inventory & organize
- Y -- Your safety is important