

Prioritizing Safety in the Laboratory

Multidisciplinary Laboratory (MDL)

Dear Students,

"Do you know that following proper safety protocols in the lab can prevent accidents that may cost more than just your experiment? Safety isn't just a rule; it's an investment in your future."

INTRODUCTION

Multidisciplinary Laboratory (MDL)

Located at IMU level 3 and 4

MDL have 9 labs

MDL 1 & 2

MDL 3

MDL 5 & 6

MDL 7 & 8

Pathology Lab

Nutrition & Dietetics (N&D) Lab

Let's Have Some [Virtual TOUR](#)



What do you think is the most dangerous thing in the laboratory?



The most dangerous element in a lab is when it's someone who doesn't know what they're doing



Do you have the right safety attitude?



Don't know? PLEASE Ask



Be prepared, study ahead. Come in and execute



Follow instruction given by lecturer and staff.




Treat all chemical and organism are hazardous.



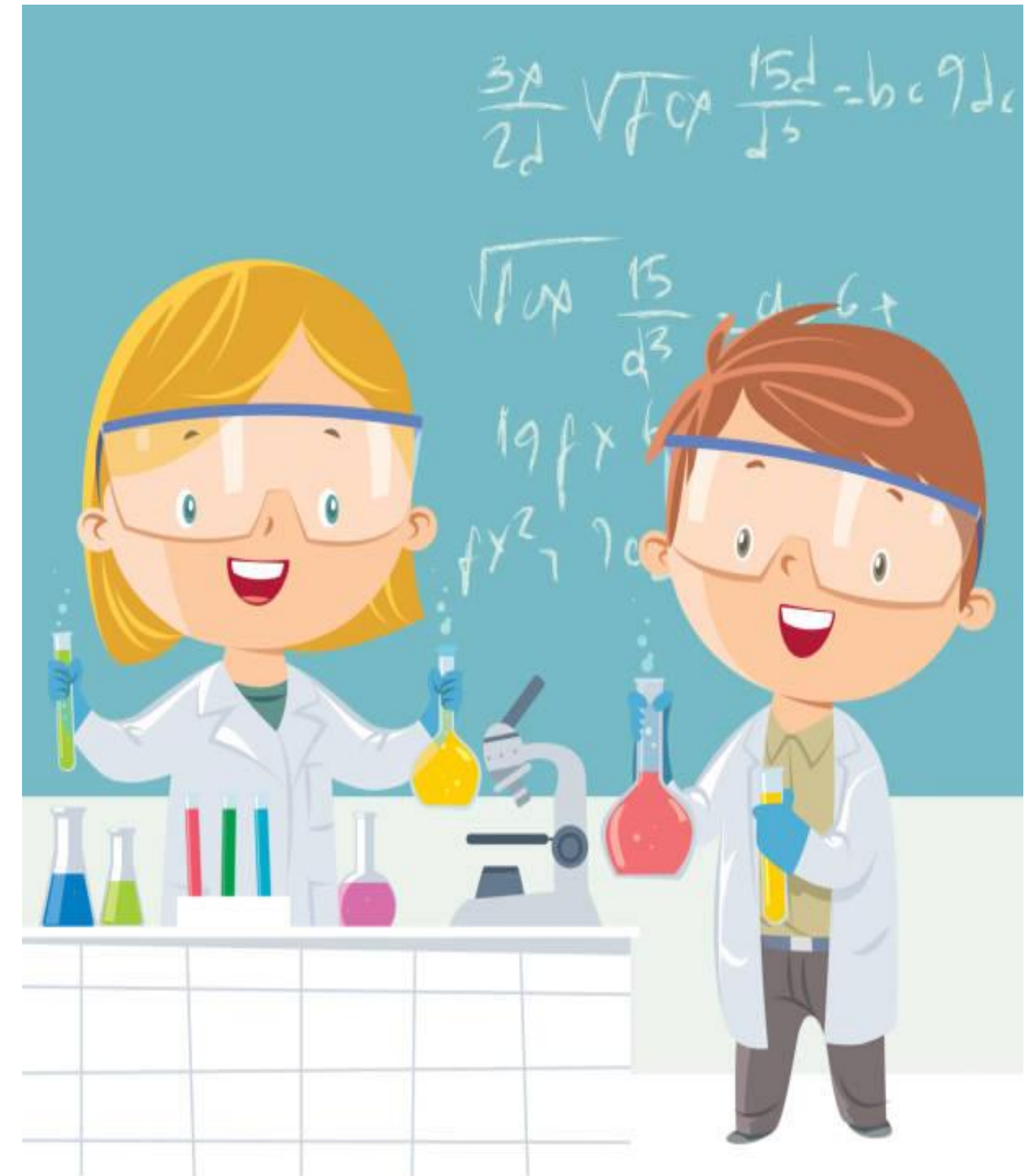
Do you have the right safety attitude?

 Be FOCUS

 Common Sense

 Protect yourself and others

 Safety First



DRESS CODE IN MDL

Safety Goggles

- ✓ **Compulsory as per module requirement**
- ✓ **Safety goggles are required of everyone who enters a chemical work area.**



Safety Lab Coat

- ✓ **Buttoned-up sleeve lab coat**
- ✓ **Wearing a Safety Lab coat outside of the MDL area is strictly PROHIBITED**

Cover the entire leg

- ✓ **Shorts, or pants/capris that leave any part of the leg exposed are NOT permitted in the lab.**

Fully covered shoes

- ✓ **Wear non-permeable material**
- ✓ **Shoes must completely cover the feet. Shoes with holes (including sandals, ballet flats, open-toe, open weave, and canvas material shoes) are NOT allowed**

DRESS CODE IN MDL

Safety Goggles

- ✓ Compulsory as per module requirement
- ✓ Safety goggles are required of everyone who enters a chemical work area.

Cover the entire leg

- ✓ Shorts, skirts, or pants/capris that leave any part of the leg exposed are NOT permitted in the lab.



Safety Lab Coat

- ✓ **Buttoned-up long-sleeve lab coat**
- ✓ Wearing a Safety Lab coat outside of the MDL area is strictly **PROHIBITED**

Fully covered shoes

- ✓ To wear **non-permeable material**
- ✓ Shoes must completely cover the feet. Shoes with holes (including sandals, ballet flats, open-toe, open weave, and canvas material shoes) are NOT allowed

DRESS CODE IN MDL

Shoes with small holes are not allowed





DRESSCODE IN ND Lab

Dear Students,

"Do you know that a lab coat isn't just a fashion statement? It's your shield against potential hazards in the laboratory, so wear it with pride and safety in mind!"

PERSONAL PROTECTIVE EQUIPMENT (PPE)

HAND PROTECTION

- The purpose of gloves is to protect against abrasions, cuts, punctures, snags, chemical burns, thermal burns, and temperature extremes in the work environment.
- In the MDL we have:
 - Latex glove
 - Nitrile glove
 - Neoprene glove
 - Puncture-resistant glove
 - Heat resistance glove
 - Cotton glove



PERSONAL PROTECTIVE EQUIPMENT (PPE)

RESPIRATORY PROTECTION

- A respirator is a device designed to protect the wearer from inhaling harmful dust, fumes, vapors, and/or gases. It helps to protect your lung.
- The air-purifying respirator- surgical mask, respirator (cartridge-acid/base and mercury filter)



GENERAL LAB RULES



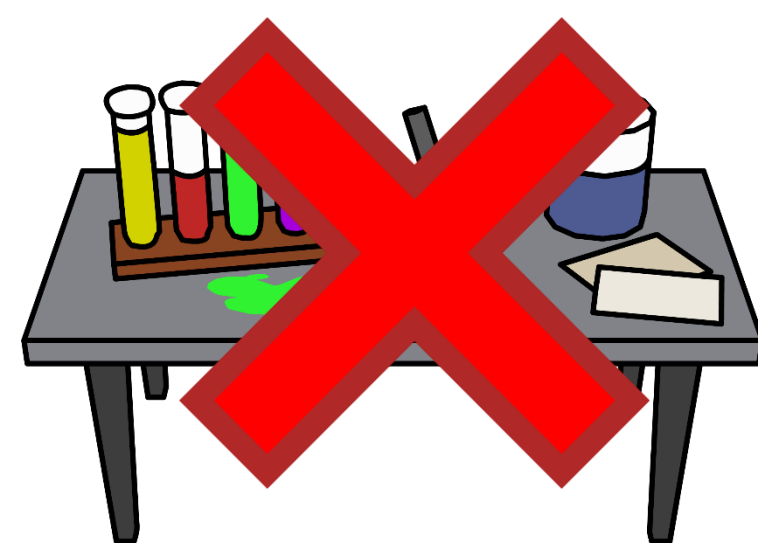
Wearing proper PPE



NO Food & Drink



No Smoking or Vaping



Keep your workbench clear of clutter



Do not run. Do not indulge in horseplay. Mind those stools



Familiar with safety equipment and Spill kit



GENERAL LAB RULES



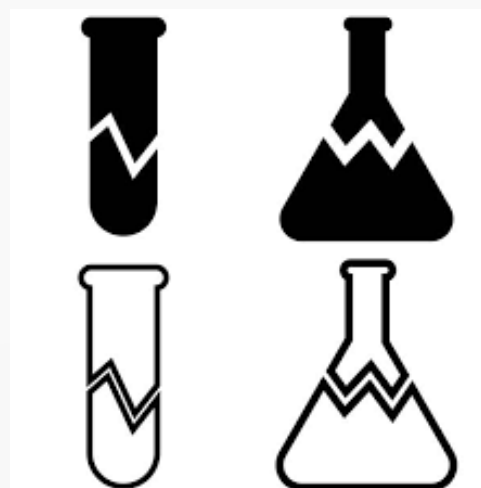
Report all accidents or chemical spills immediately to lecturers and lab staff.



Use a fume hood when handling toxic and fume chemicals.



Report all breakages to Lab staff



Glassware – Check before use. Once broken consider sold



Do not remove items belonging to the lab.



No Gloves

Do not wear gloves out of the lab.



GENERAL LAB RULES



Silenced your cell phone and keep it in your pocket.



Take care of your own gadget (Tablet & Smartphone) – Can be Mobile Petri Dishes -Before using a cell phone, please remove PPE.



Do not wear a lab coat **out of the lab**



Wash your hands thoroughly with soap and water before leaving the laboratories.





IMU GROUP'S GUIDELINES

When to Wear a Mask

Mandatory to wear Face Mask



If COVID-19 positive

When caring for or dealing with patients in a health facility, as per infection and prevention control practices



If having respiratory symptoms (eg cough, flu, sore throat, etc)



If you are symptomatic but tested negative for COVID-19, please wear a mask when at campus

Encouraged to wear Face Mask



If you belong to a high risk group (Senior citizens, the chronically ill, those with low immunity and pregnant ladies)



If you're in a poorly ventilated / crowded areas



When using public transport (Bus / Taxi / E-hailing vehicles / Train / Aeroplane and Employee / School shuttle)



Clean hands save lives



1
Palm to palm



2
Between fingers



3
Back of hands



4
Base of thumbs



5
Back of fingers



6
Fingernails



7
Wrists



8
Rinse and wipe dry



MDL
EMERGENCY
FACILITIES

EMERGENCY CONTACT

- ✓ Available in every lab
- ✓ Familiar with the location

EMERGENCY CONTACT CAMPUS BUKIT JALIL

  	 
POLICE IPD Cheras 03-9205 0222 Balai Polis B.Jalil 03-8994 3284	HOSPITAL P.P.U.K.M 03-9145 5555
 	 
FIRE RESCUE SERVICES BOMBA Bukit Jalil 03-8996 7457	24/7 IMU MENTAL HEALTH SUPPORT 015-4877 0426 011-3011 6842 (WHATSAPP)
  	 
EMPLOYEE ASSISTED PROGRAMME (EAP) FOR STAFF (Nur Athirah Binti Mustapha) 03-2731 7661 EXT 1821	SECURITY/CONTROL ROOM- 24/7 03-2731 7788
 	 
IMU RECEPTION—8:30am-5:30 pm 03-2729 6868	IMU Clinics 8:30am-5:30pm 03-2731 7799
MALAYSIA EMERGENCY RESPONSE SERVICES (MERS) 999	

MDL **EMERGENCY** FACILITIES



1 Emergency Shower

- Large spill on the body.
- Go under the shower.
- Remove lab coat? Depends...
- Pull down the handle.
- Shower.
- Close curtain.
- Know the location beforehand
- Change your contaminated clothing – please request from Lab staff



② Emergency Eyewash

- Push handle
- Prior to medical treatment, rinse for 15 minutes.
- Keep your eyes open!



3 First Aid Box

- One per lab (inside a drawer at the side bench)
- Look for signage.
- Inform lab staff/lecturer if have any injuries



4 Fire Extinguisher

- Look for signage
- Inform lab staff/lecturer if have any incident involving fire
- Two types:
 - ✓ ABC powder –all type of fires
 - ✓ Carbon dioxide –electrical



Fire Extinguisher Types and Uses

Fire Risks & Types

More Info Click >



WATER

DRY POWDER

FOAM

CO2

WET CHEMICAL

PAPER, WOOD, TEXTILES



FLAMMABLE LIQUID



FLAMMABLE GASES



ELECTRICAL HAZARD



METALS



COOKING OILS



5 Emergency Exit (KELUAR Sign)

- Where is the emergency exit to the building?

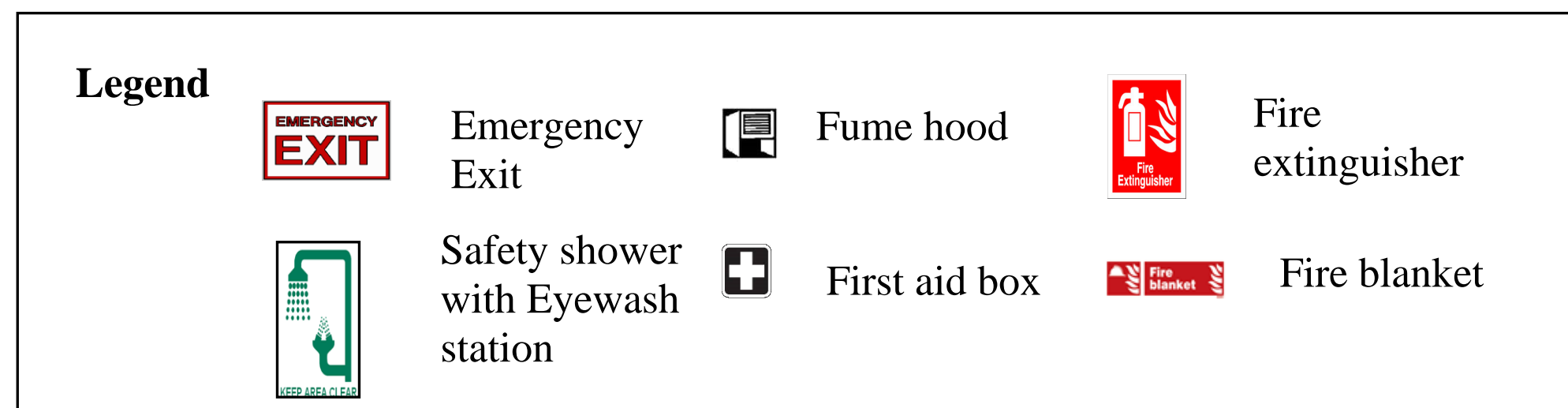
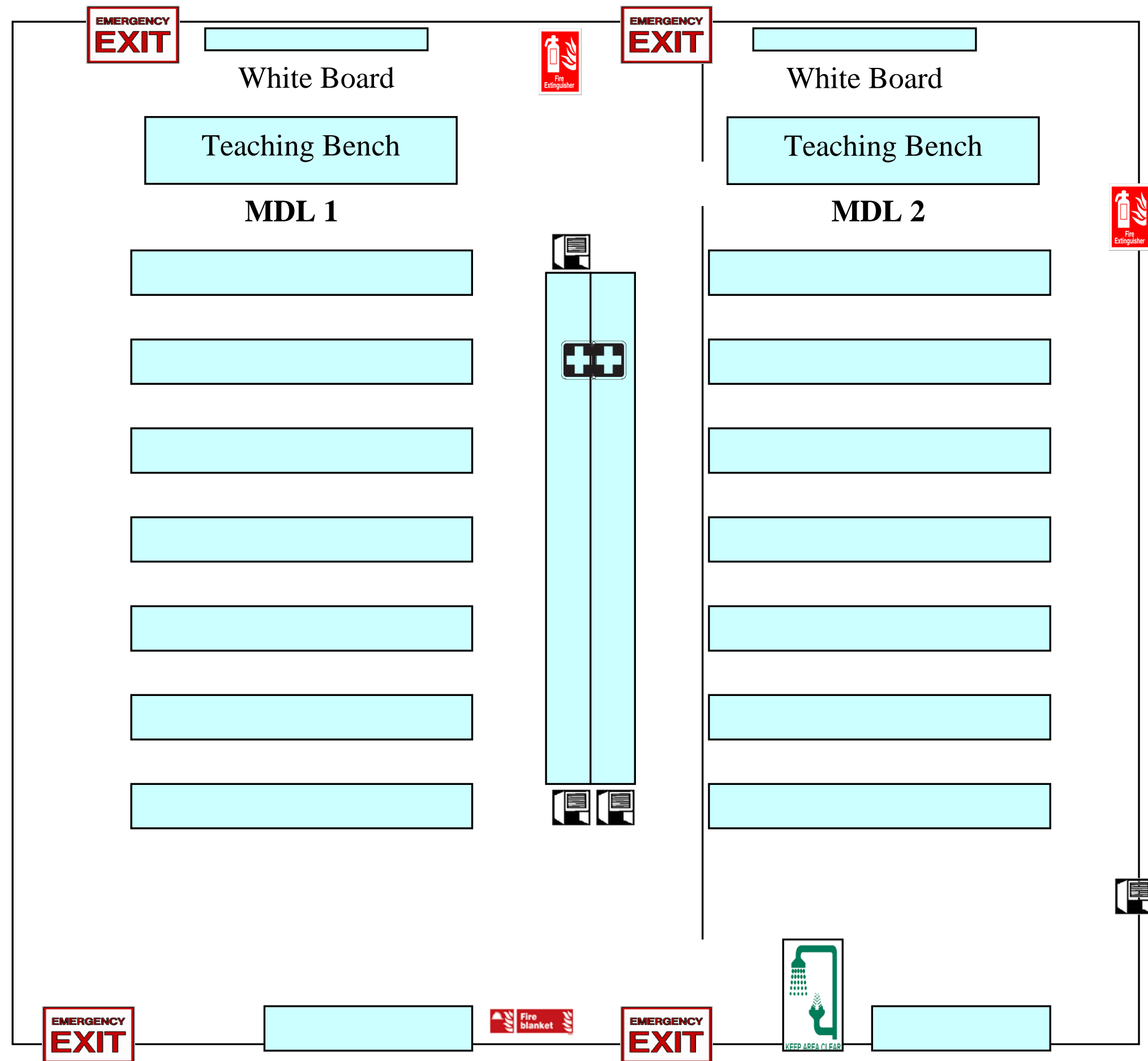


6 Fire Blanket

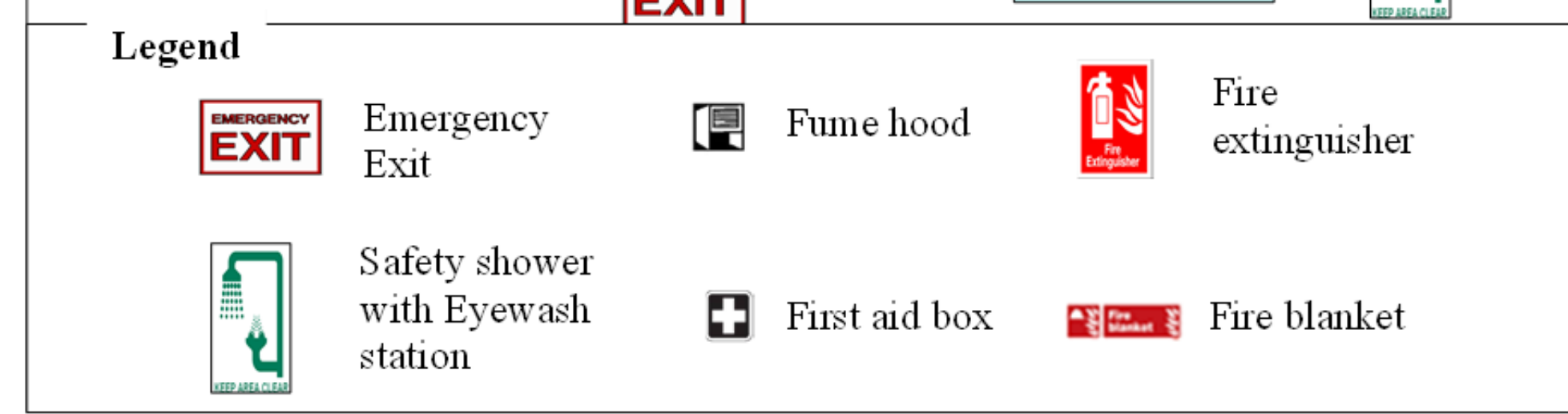
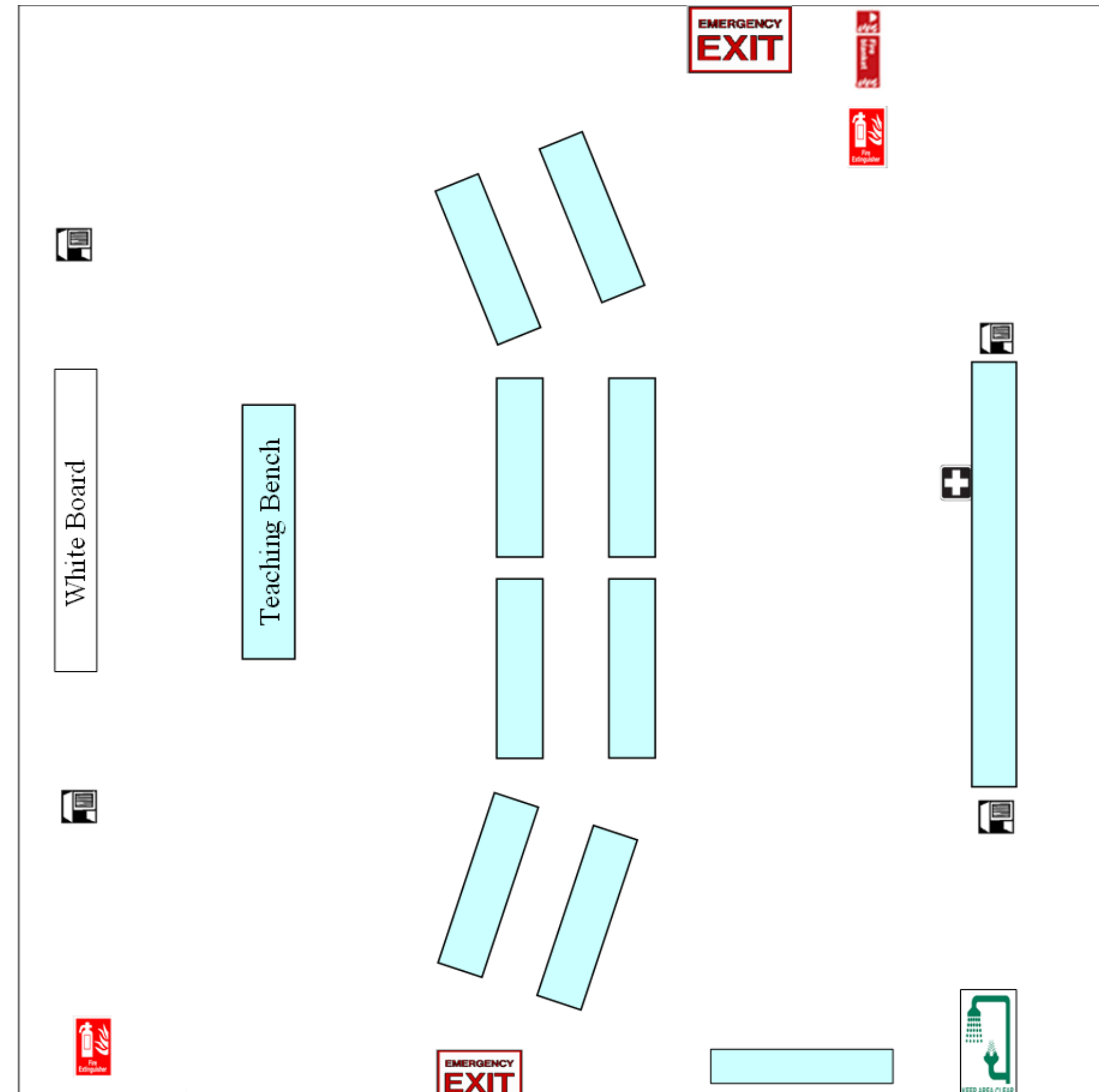
- Used to extinguish small fires
- Made from Fire-retardant materials (designed to burn slowly)
- Useful in smothering fires by not allowing any oxygen to the fire
- Can be used to wrap around a person whose clothes have caught fire.



Location of Safety Equipment MDL 1 & 2



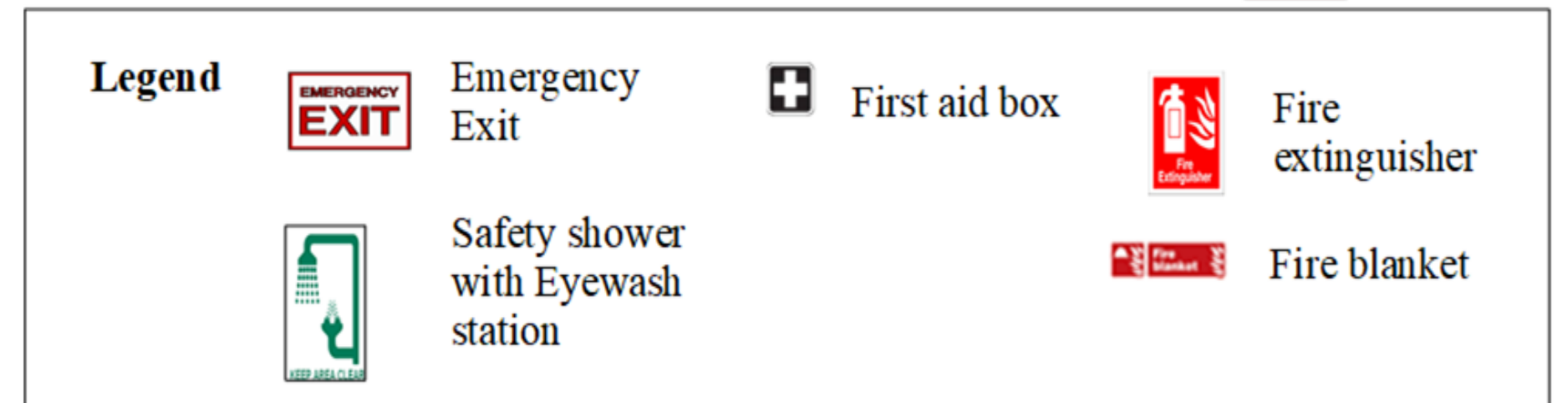
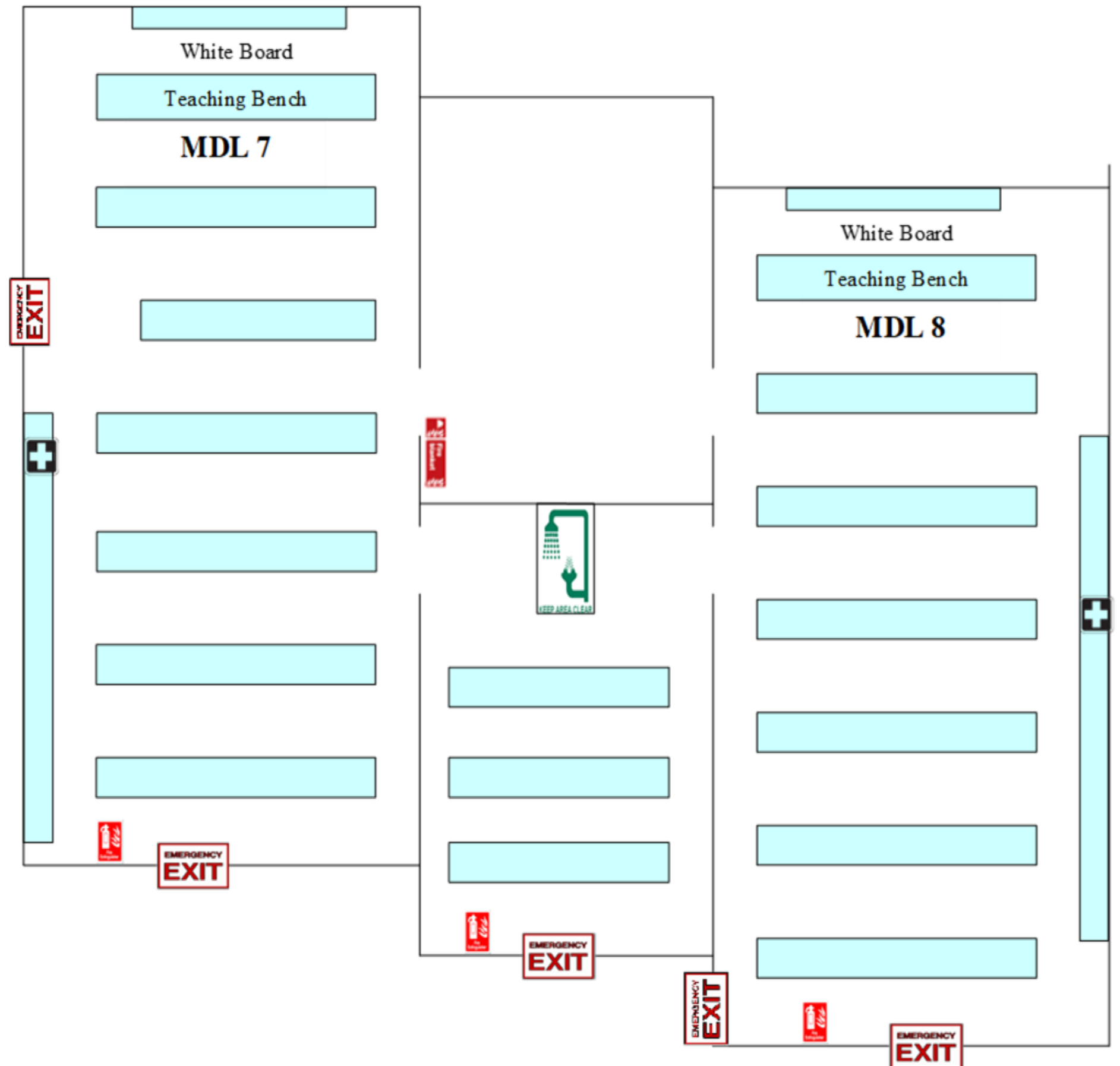
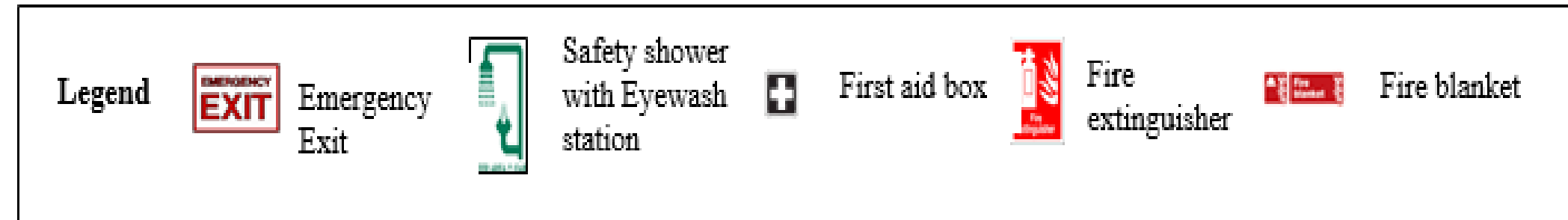
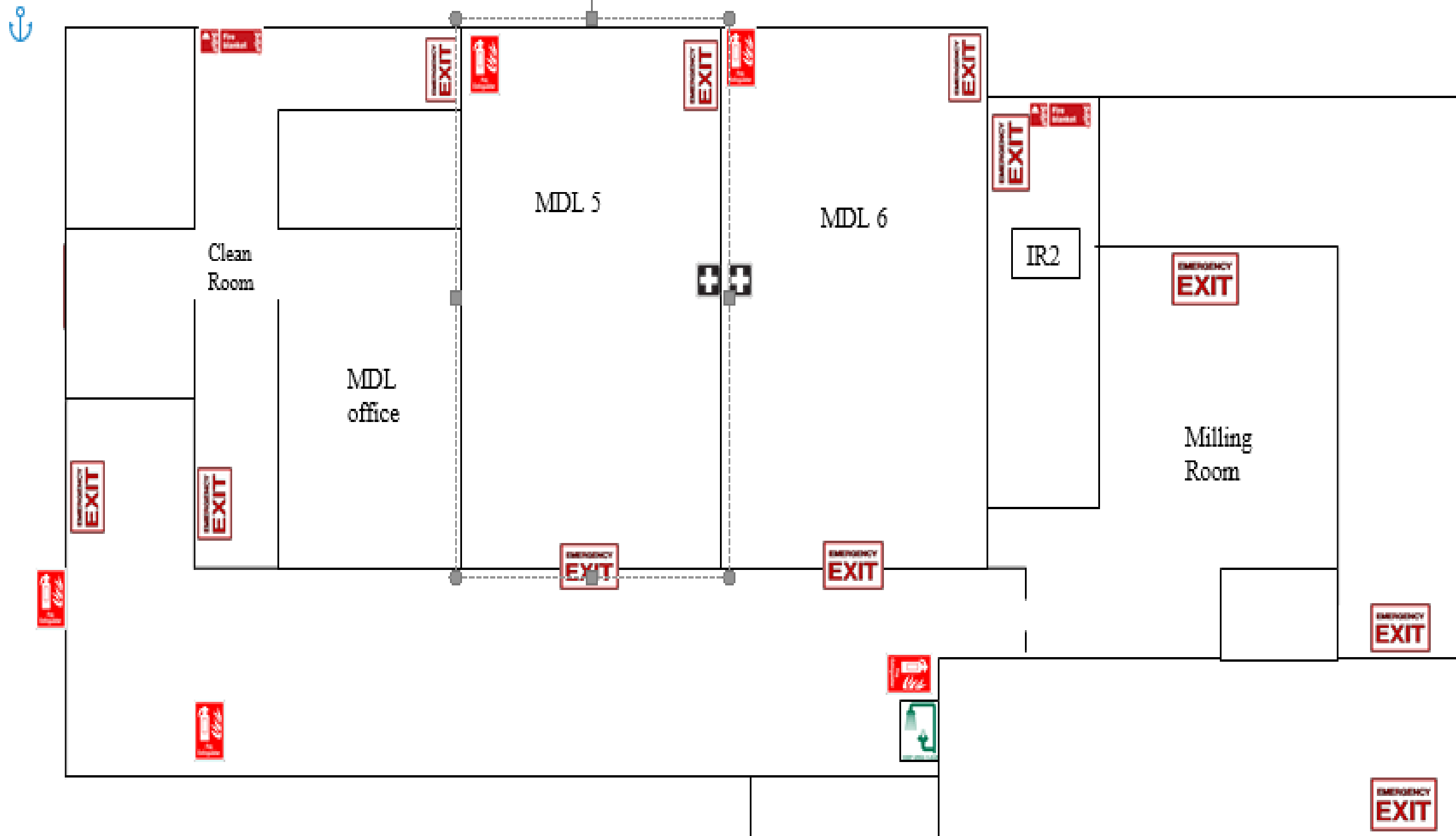
MDL 3



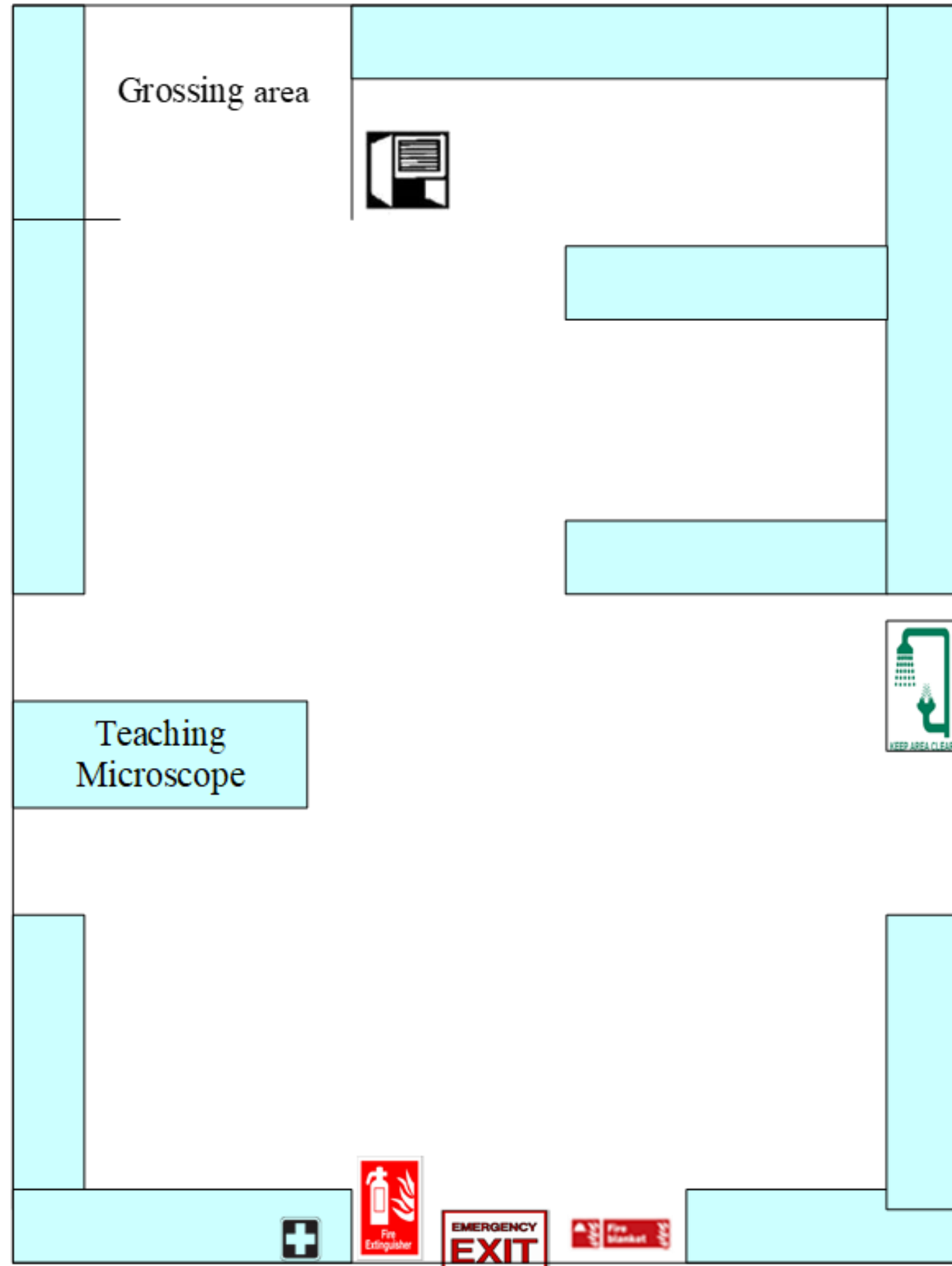
Location of Safety Equip MDL 7 & 8



MDL 5, MDL 6, Milling Room, Clean Room & IR2



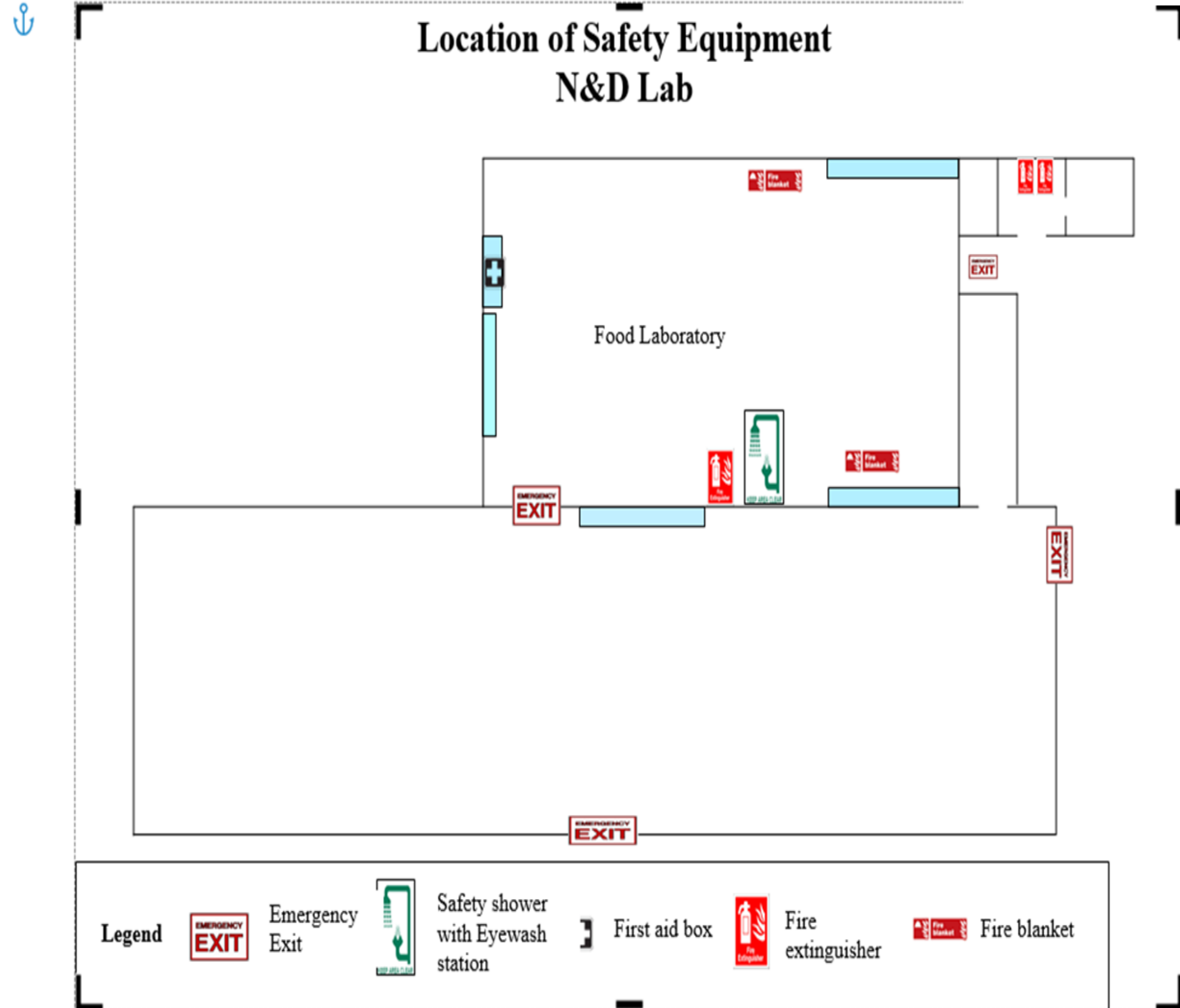
Location of Safety Equipment Pathology Lab



Legend

	Emergency Exit		Fume hood		Fire extinguisher
	Safety shower with Eyewash station		First aid box		Fire blanket

Location of Safety Equipment N&D Lab



Legend

	Emergency Exit		Safety shower with Eyewash station		First aid box		Fire extinguisher		Fire blanket
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HANDLING HAZARDOUS CHEMICAL

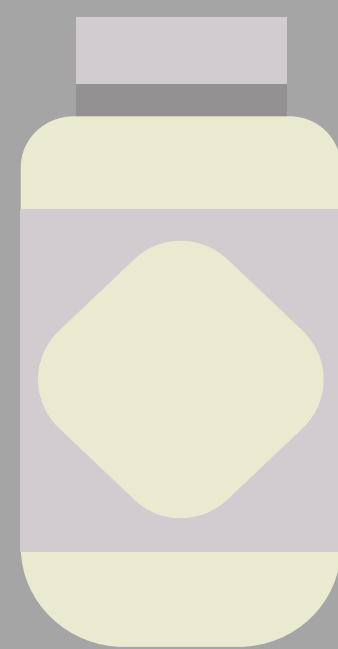
Chemical Labelling follow CLASS regulation (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations



Hazard Pictogram: 9 pictograms












Hazard Class : Nature- flammable, corrosive
Hazard Category: like flammable
have 4 category



All chemical information – SDS
(Safety Data Sheet)



Health Hazard	Flame	Exclamation Mark
 <ul style="list-style-type: none"> • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity 	 <ul style="list-style-type: none"> • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides 	 <ul style="list-style-type: none"> • Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder	Corrosion	Exploding Bomb
 <ul style="list-style-type: none"> • Gases Under Pressure 	 <ul style="list-style-type: none"> • Skin Corrosion/Burns • Eye Damage • Corrosive to Metals 	 <ul style="list-style-type: none"> • Explosives • Self-Reactives • Organic Peroxides
Flame Over Circle	Environment (Non-Mandatory)	Skull and Crossbones
 <ul style="list-style-type: none"> • Oxidizers 	 <ul style="list-style-type: none"> • Aquatic Toxicity 	 <ul style="list-style-type: none"> • Acute Toxicity (fatal or toxic)

CHEMICAL HAZARD PICTOGRAM

Chemical Safety

**"Unleash the Chemical
Safety Superhero in You -
Watch Now!"**



Safety tips in chemistry lab?

- ✓ PPE
- ✓ Familiarize with chemical hazard symbols.
- ✓ Do not point a test tube at any person
- ✓ No mouth pipetting
- ✓ Always fill a burette below eye level
- ✓ Chemical waste is to be discarded into designated waste containers. NOT down the sink.
- ✓ Check on the glassware condition before starting your practical - return chipped glassware to lab staff for replacement immediately
- ✓ Never handle chemicals with your fingers, even if wearing gloves. Use spatula
- ✓ Diluting acid: Add acid to water



FUME HOOD



or

FUME CUPBOARD

- ✓ For task which produce toxic products or fumes
- ✓ When working with compounds that have an offensive odor.
- ✓ Eg: Hydrochloric acid (concentrated)



1

Move away from the spill

2

Immediately wash off any spillage onto your hands/any part of the body with plenty of water.

3

Use an emergency shower and eye-wash if necessary

4

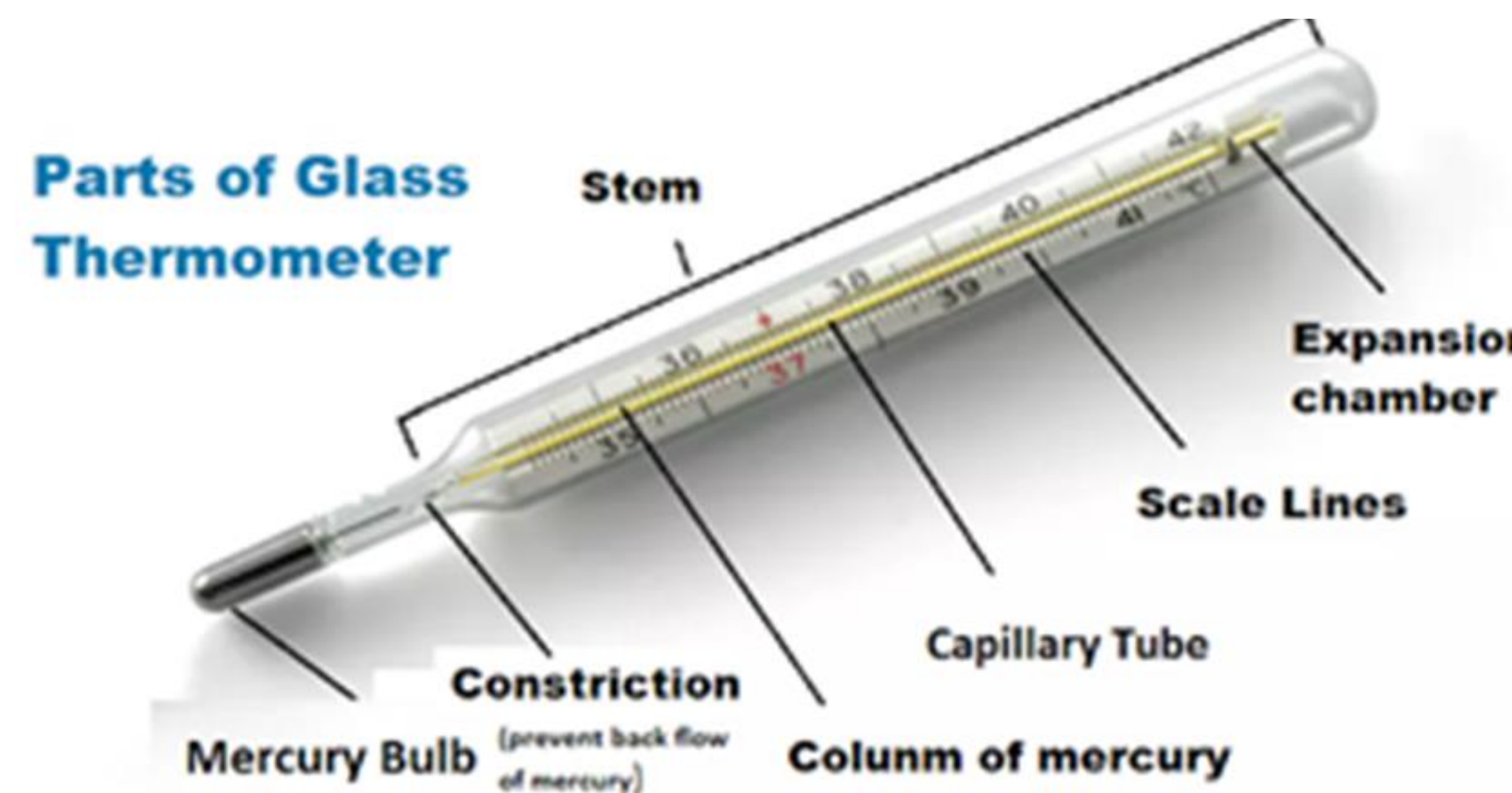
Inform the lecturer and/or lab staff for further action

CHEMICAL SPILLAGE



Mercury spillage

- In MDL, mercury can be found in thermometers.
- The precautions should be followed when handling mercury thermometers:
 1. Inspect the thermometer condition before use
 2. Don't rinse the thermometer while it is still hot.
- Notify the lab staff or lecturer immediately if this mercury spillage incident happens.



Sign and Symptoms

Sign and Symptoms Cause By Short-term Exposure To Mercury		
Cough, sore throat	Eye irritation	A metallic taste in the mouth
Shortness of breath	Increase in blood pressure	Headache
Chest pain	of heart rate	Vision problem
Nausea, vomiting, Diarrhea		
Sign and Symptoms Cause By Long-term Exposure To Mercury		
Anxiety	Loss of appetite	Tremors
Sleeping problems	Irritability	Change in vision
Forgetfulness	Fatigue	Change in hearing

BIOLOGICAL HAZARDOUS

Example: Blood, body fluid, tissue samples & etc.

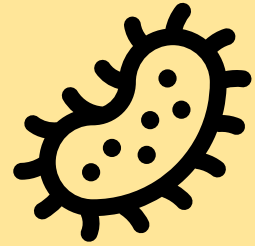
Discard all used scalpel blades, syringes, needles, and broken glasses into the sharp bin

Upon completion of your task, disinfect the working area using methylated spirit

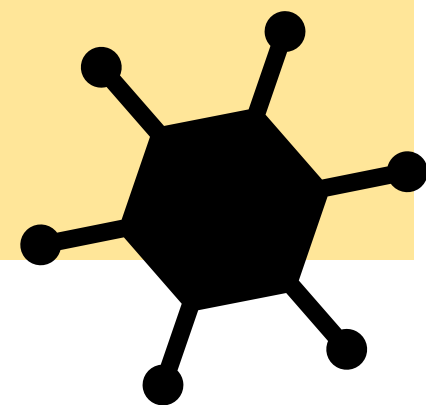
Wash your hands thoroughly using disinfectant detergent like Surgi scrub before leave



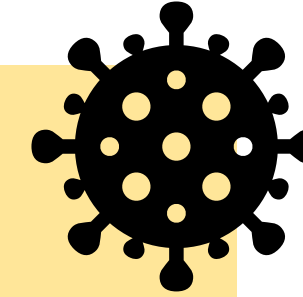
MICROBIOLOGICAL HAZARDS



- Example: Infectious agents (bacteria, viruses, fungi etc)
- Use aseptic techniques in all microbiological manipulations
- Wash your hands thoroughly using a disinfectant detergent like Surgi scrub before leaving.



- Before lighting the Bunsen burner, make sure there are no flammable materials nearby (Eg: Methylated Spirit)



- Discard Petri dishes containing unwanted bacterial cultures into the appropriate autoclavable plastic bags for decontamination.

KITCHEN LAB SAFETY



Wear Proper attire – Apron, beret, and cover shoes. Avoid wearing accessories, especially dangling jewelry.



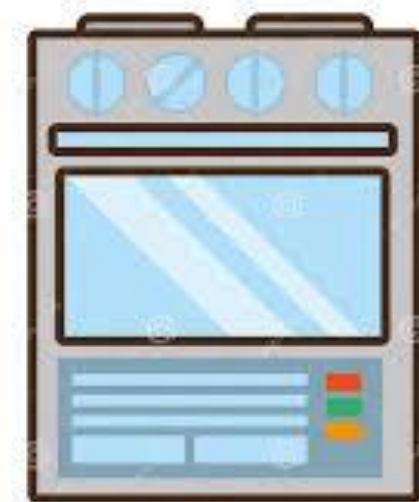
Avoid burns - Be careful when carrying hot food items or equipment in the lab – wear a thick glove



Wash hands thoroughly with soap before eating, using the restroom, handling garbage, and leaving the lab.



Avoid cuts: Be careful when handling with sharp items – knife



Do not use the stove top as a working bench



Report all accidents/incidents immediately to the lecturer or lab staff.

GENERAL HOUSEKEEPING RULES



Only put the apparatus and equipment that needed on the bench



Switch off and unplug electrical equipment when you have finished using it.



Keep your working area as clear as possible



Deal with spills immediately



Wash glassware with detergent and brush provided. Return washed glassware to original place



GENERAL HOUSEKEEPING RULES



Tidy up the bench after use.

Return the items to their correct location



Where to discard used or contaminated items in the MDL lab?



Pedal bin with biohazard bag

To discard used gloves



Sharp bin

To discard broken glass, needles, sharp items



Waste paper basket

Non hazard waste:
Paper & tissue

CHEMICAL WASTE

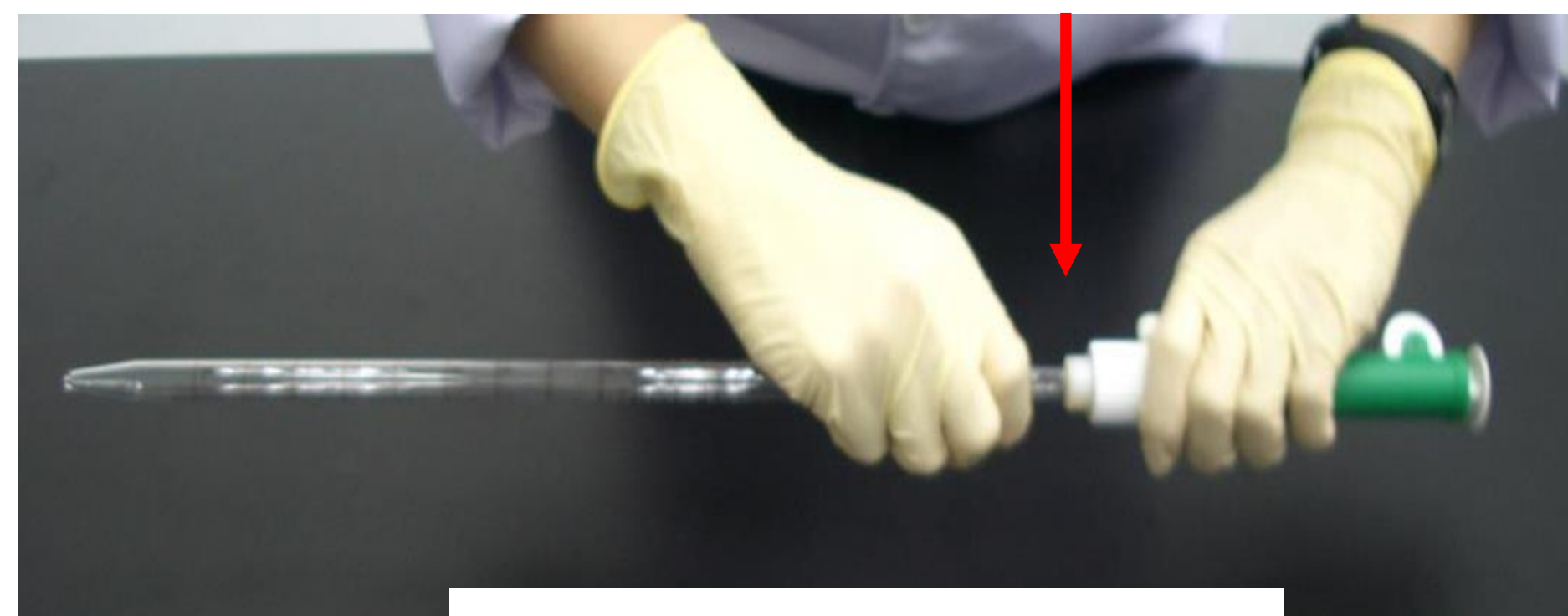


- ✓ Follow instructions given
- ✓ Read the chemical waste container label properly before discarding the waste
- ✓ **DO NOT** discard chemical waste into the sink
- ✓ ONLY lab staff are allowed to handle chemical waste containers.

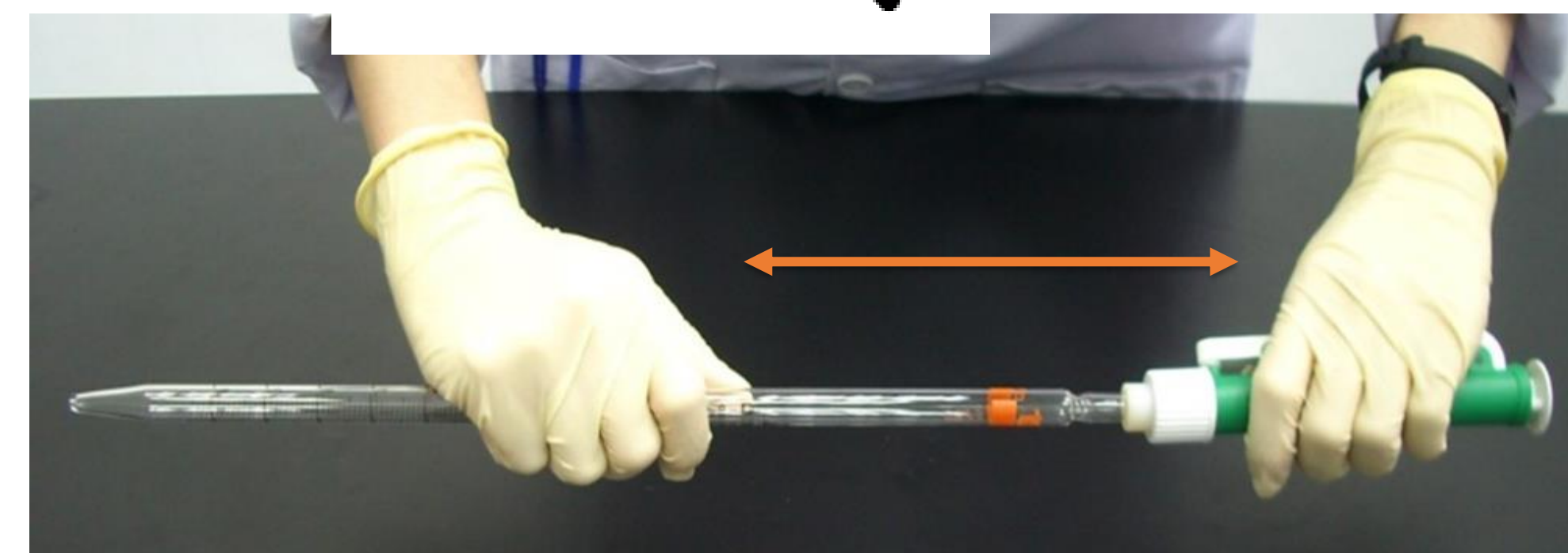


GLASSWARE SAFETY

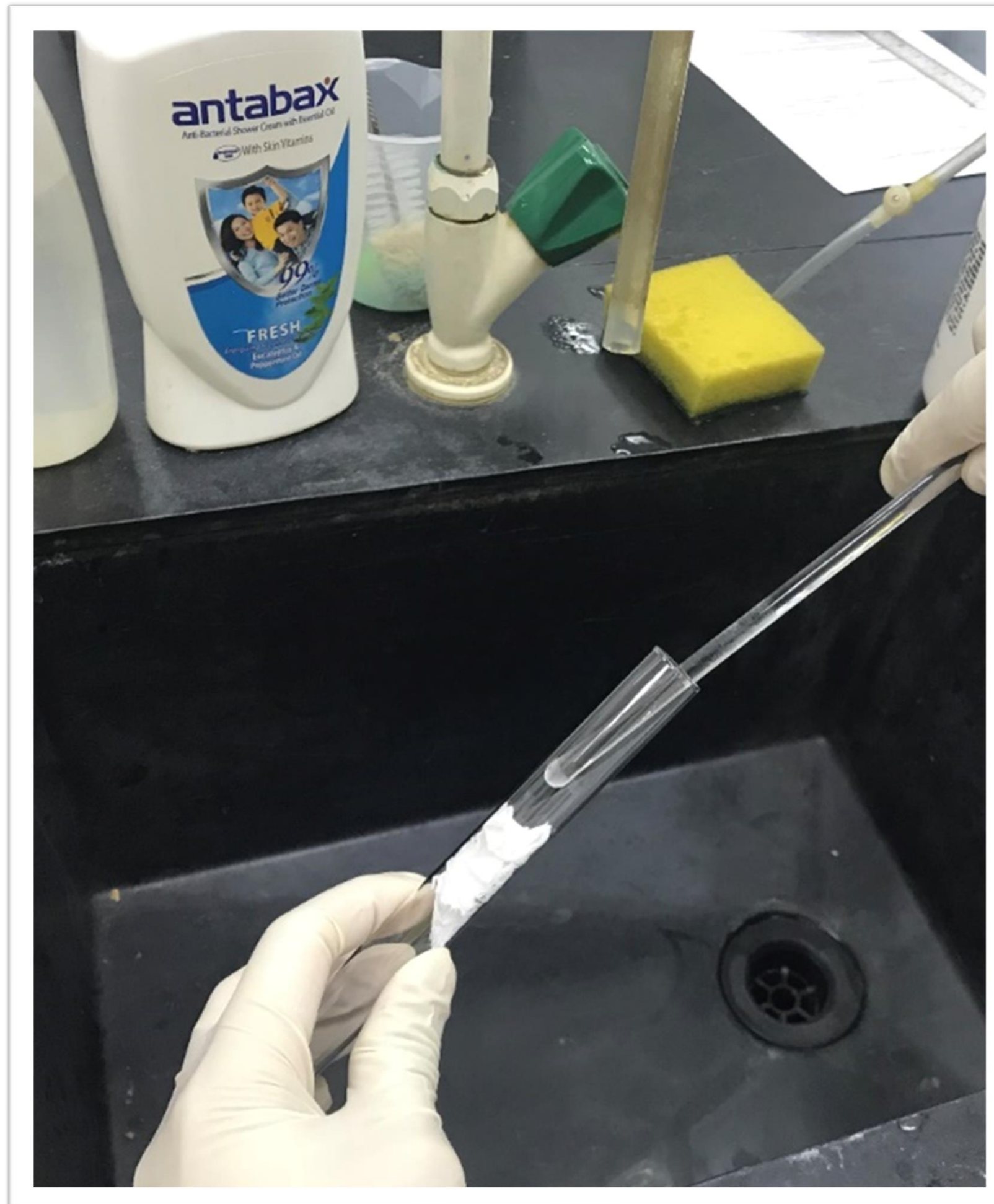
The pipette might break and cut your hand



How to attach a straight pipette with a pi-pump or filler?



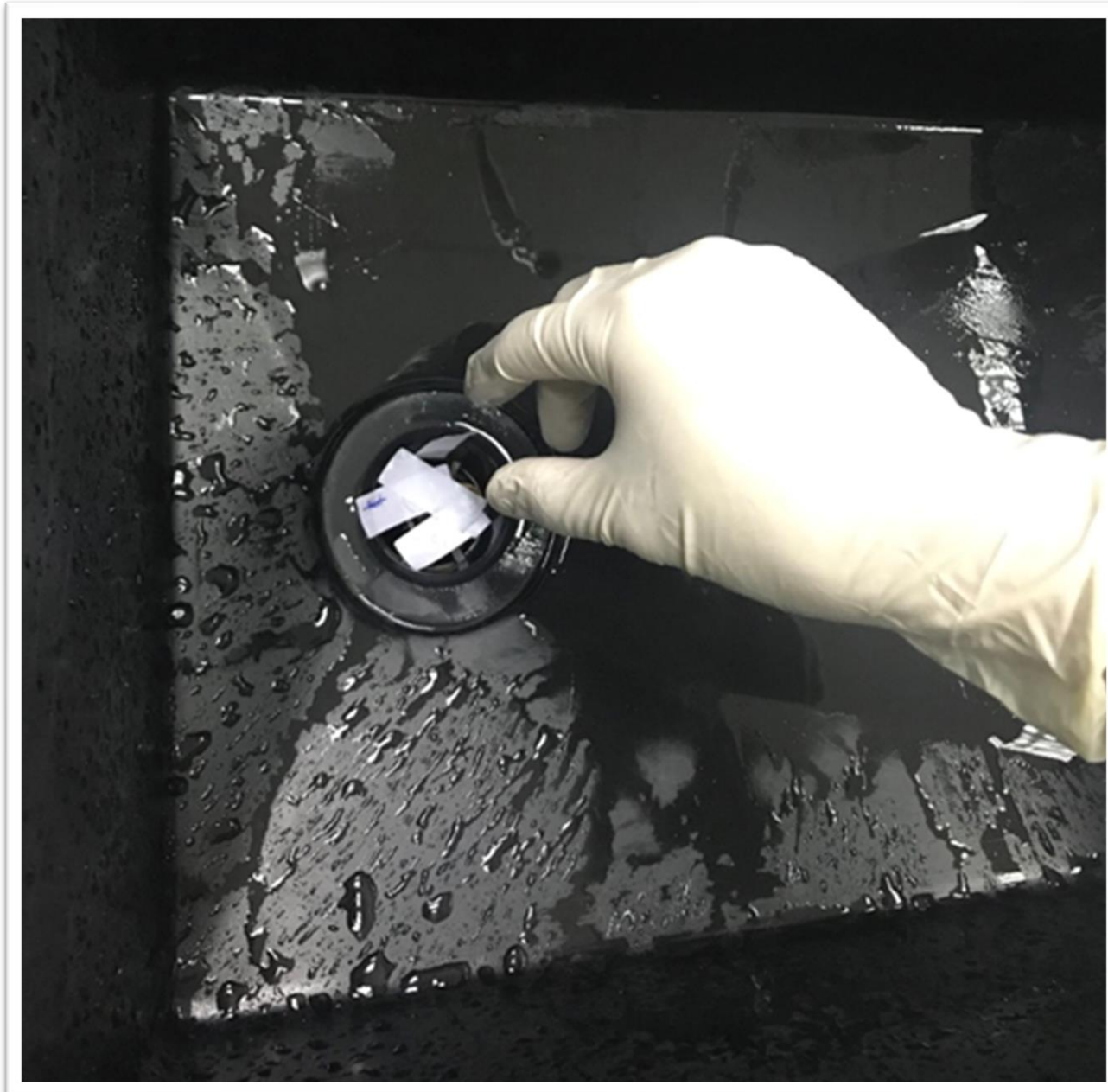
GLASSWARE SAFETY



- ✓ Someone trying to take out the tissue paper using a glass rod.
- ✓ The glass rod broke and resulted in a deep cut at the palm.

**BASED ON A
TRUE STORY**

GLASSWARE SAFETY



- ✓ Your sink clogged?
- ✓ Never use your bare hand to remove it because you never know what lies beneath it.
- ✓ Instead, ask for help from the Lab Staff. We have forceps to help you
- ✓ To avoid this, remove the label first before washing the glassware!





NEEDLE STICK INJURY

is a puncture wound or injury caused by a needle or other sharp medical instrument, such as a syringe or lancet, accidentally piercing the skin



CAUSE BY?

needles points of medical sharps
like needles, scalpel blades etc

WHY HAPPEN?

occur with a variety of unsafe
motions

EXAMPLE OF UNSAFE MOTION?

- uncapping the needle
- drawing up a solution
- recapping needles
- removing a needle from a syringe barrel
- improper use of needle safety devices
- poor injection technique.



NEEDLE STICK INJURY

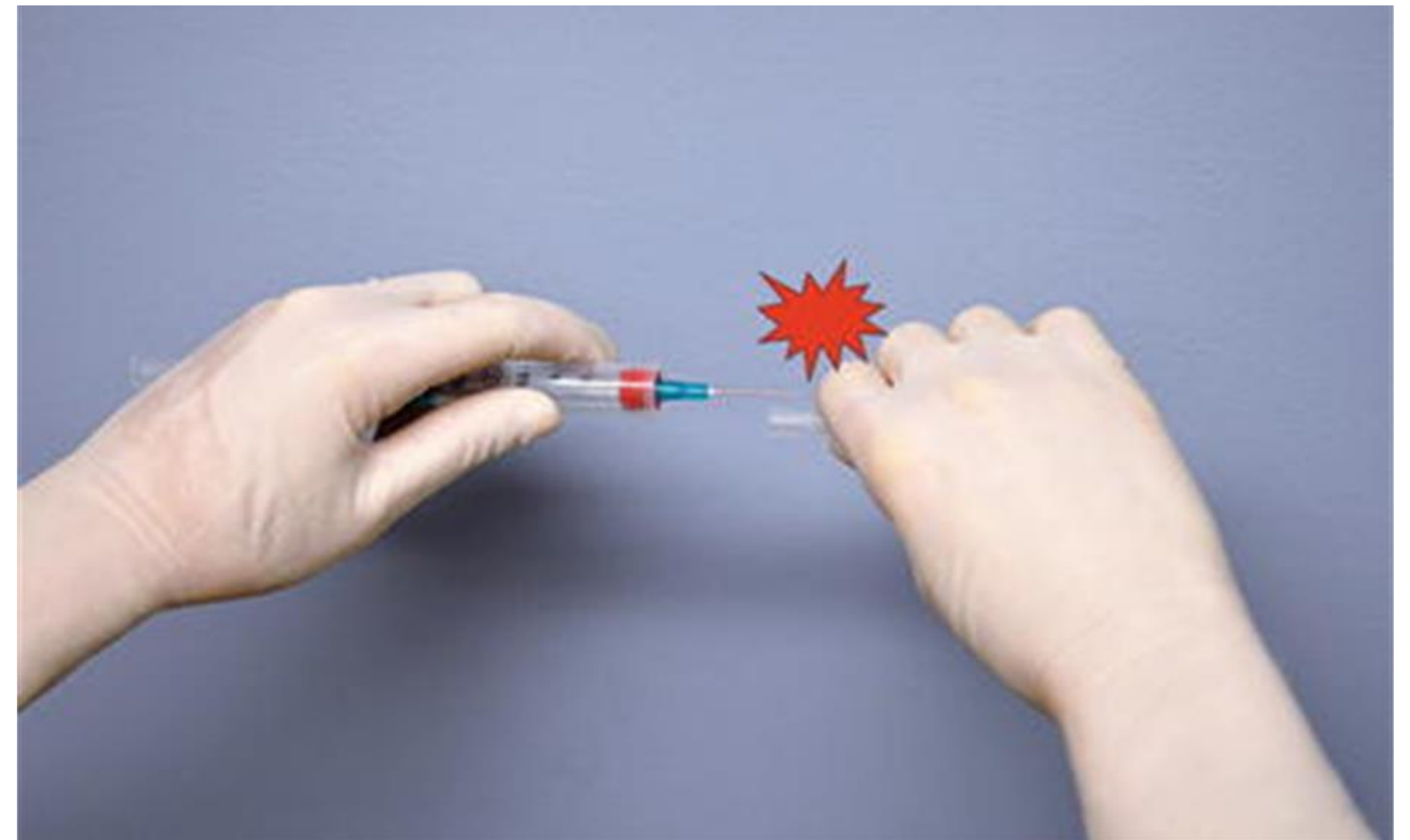
What is the unsafe motion that frequently happens in MDL?



Uncapping the needle



Recapping needles





NEEDLE STICK INJURY

How to safely Recapping of needle (One-scoop technique)



First, place cap on a level horizontal surface; gently slide needle half-way into cap...

Then, slowly tip up needle end of the device and allow cap to slide over needle...

Finally, use the thumb of the hand holding the device to secure the cap on the syringe.

Figure 2 One-handed scoop technique for needle recapping

- ✓ Recapping of needles should be avoided if possible. Because an accidental puncture or needlestick might occur.
- ✓ Although the wound is small and easily cared for, this injury has a high risk of infection
- ✓ Always immediately report them and seek medical attention





INSTRUMENT SAFETY AND MAINTENANCE



**The Equipment Handling video can be
found in IMU Student Portal**



INSTRUMENT SAFETY AND MAINTENANCE



Hotplate

- Do not place wire on hot surface

Analytical Balance

- Keep equipment clean. For example, balance free from spills
- Securely replace the cover on all stock containers immediately after use.





INSTRUMENT SAFETY AND MAINTENANCE

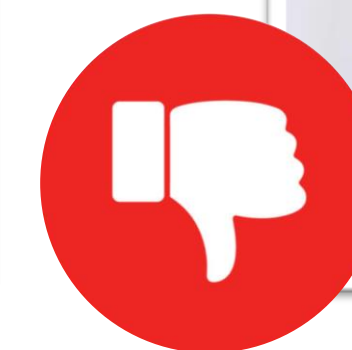


Microscope

- Clean the objective lenses (40x and 100x) with lens paper
- Switch off the microscope, unplug, remove the slide on the stage and cover it

pH meter

- Electrode should be immersed in the storage solution after use.
- Do not leave electrodes on the bench.



The Power of Positive Safety Attitudes

Think Safety First

"My Commitment to Think Safety First"

Know what you working with

"Know Your Tools: The Key to Efficient and Safe Work"

Protect yourself

"Protecting Yourself with PPE: Safety Gear for a Safer You"

Practice good conduct, housekeeping and personal hygiene

"Practice makes perfect"



Follow instructions from lecturers and lab staff

"Navigating Success by Trusting Expert Instruction"

Follow all safety procedures

"Be Safety Savvy: Because Accidents Aren't on Our To-Do List!"

Common sense

"Common Sense: Your Secret Weapon for Everyday Success".

If you don't know... please ASK!!

"Don't Guess, Just Ask! Wisdom Begins with a Question."

Prioritizing Safety in the Laboratory

Multidisciplinary Laboratory (MDL)

Reference: *Student Handbook: Laboratory Safety & The Proper Use of Equipment in the Multi-Disciplinary Laboratories*

Dear Students,

 **Be Safe and Have Fun Learning!** 

