

LABORATORY SAFETY

Presented by
The Office of Risk Management
Loss Prevention

Safe laboratory procedures and training are needed for everyone!

WHY IS LABORATORY SAFETY IMPORTANT?

■ TO PREVENT:

- adverse health effects from exposure to chemicals
- exposure to organisms, diseases, etc. in laboratories
- laboratory equipment hazards - if not maintained properly

LAB SAFETY COURSE OBJECTIVES

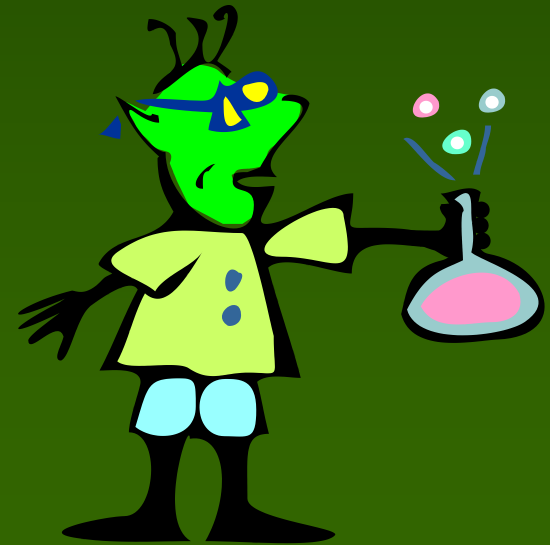
- ❑ To show importance of written laboratory program
- ❑ To show importance of safety equipment and personal protective equipment
- ❑ To show importance of care of equipment

Lab safety must be taught to :

- all employees, including service groups
- undergraduate students
- graduate students
- professors
- visitors

REVIEW LABORATORY SAFETY WHEN:

- new employees
- new procedures
- a change in procedures
- new equipment



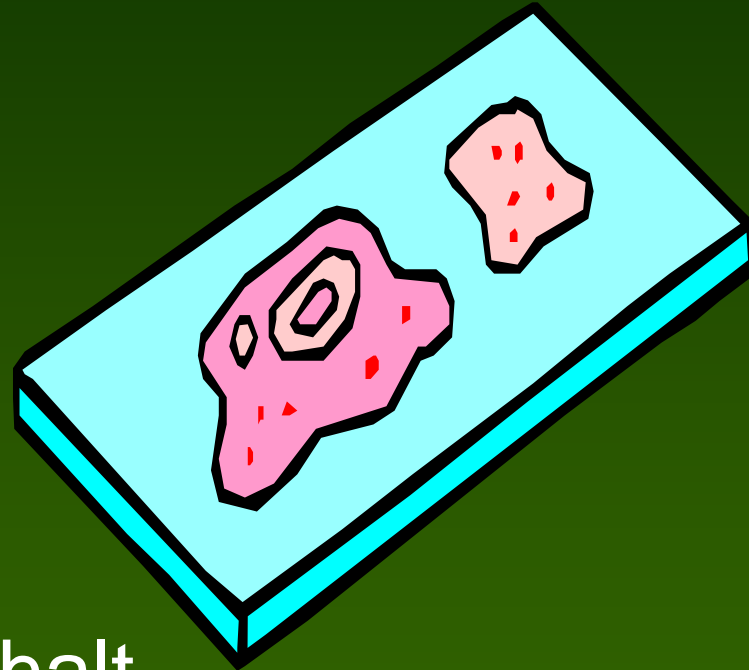
LAB SAFETY CONT..

LABORATORY PROCEDURES
MUST BE SITE SPECIFIC !

based on your lab needs,
conditions, and equipment

TYPES OF LABORATORIES

- Pathology
- Chemistry
- Biology
- Radiation
- Soils
- Concrete/Asphalt



Laboratory Policies and Procedures

Must be:

written and available



AREAS TO COVER

- General procedures or rules
- Glassware
- Material handling and care
- Equipment
- Safety equipment
- Electrical safety
- Disposal procedures
- Emergency response plans
- Inspections

General Procedures or Rules:

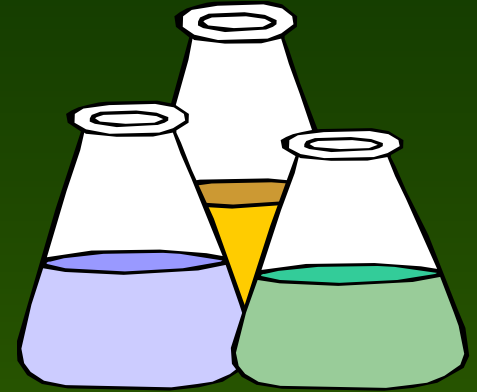
- usually common to all areas

General Procedures or Rules:

- **no** food or drink allowed in the laboratory
- **no** mouth pipetting
- individuals **not** allowed to work in the laboratory alone
- wear required personal protective equipment
- **no** smoking in laboratory
- maintain good housekeeping habits

GLASSWARE PROCEDURES

- Storage
- Proper use
- Cleaning
- Cleaning up broken glassware
- Disposal of broken glassware



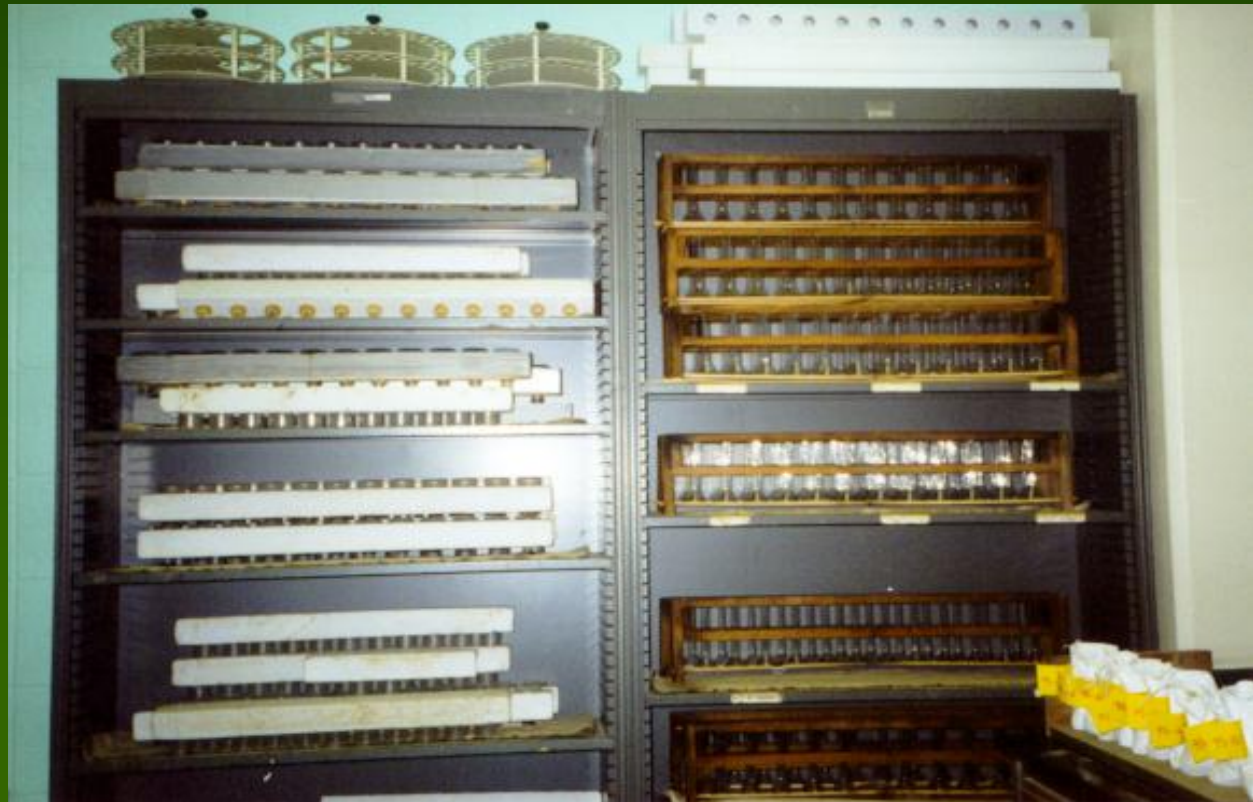
Glassware Handling

Is this what your lab looks like?



Glassware handling cont

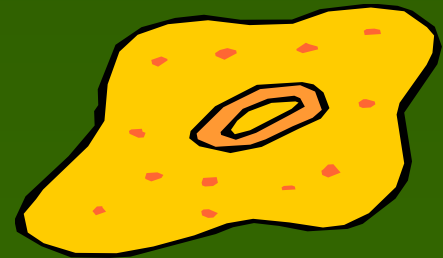
- Or does it look like this?



Laboratory Materials

- Can include

- chemicals
- plants
- animals
- pathogens
- organisms



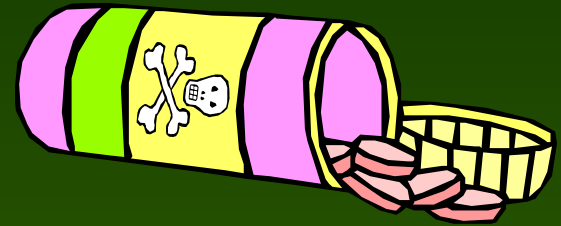
Procedures for handling chemicals

- proper labeling, including wastes
- proper storage
 - ☑ storage cabinets
 - ☑ store compatible chemicals together
 - ☑ rooms properly vented & correct temperature



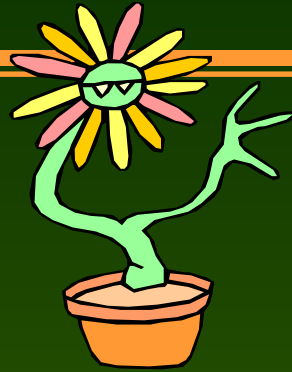
Procedures for handling chemicals cont.

- Maintain a current inventory
- Purchasing procedures
- Proper handling
 - use label or MSDS
 - **never** test by taste or odor
 - acids poured into water **never** vice versa
 - take precautions and use proper equipment when stirring or heating flammable liquids
 - follow “industry standards” for labeling all chemicals



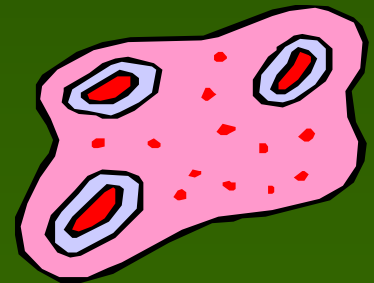
Handling animals and plants

- Procedures for caring for animals and plants including feeding and watering
- Procedures for cleaning cages
- Procedures for cleaning and/or decontaminating rooms or locations
- Procedures for entering & leaving contaminated areas
- Procedures for handling the animals or plants
- Procedures for animal bites or scratches
- Procedures for disposal to prevent spread of disease



Handling of diseases or organisms

- Allow **only** authorized individuals in infectious disease laboratories
- Do **not** allow individuals to work alone
- Procedures for proper use of equipment and maintenance
- Use proper containers for transportation, incubation, and storage
- Labeling of laboratories and cultures
- Proper disinfecting procedures
- Hygiene procedures
- Procedures for exposure or release of material



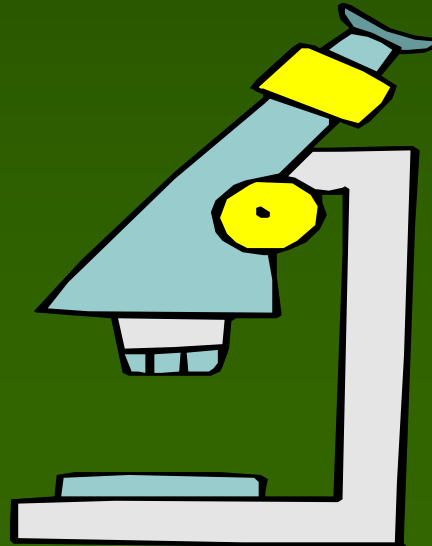
Handling and Using Lab Equipment

- Proper installation
- Training on proper use
- Manuals or written procedures available
- Inspections
- Maintenance
- DOCUMENT



EQUIPMENT INCLUDES:

- Meters
- Refrigerators
- Autoclaves
- Scales
- Hoods
- Drying oven
- Compressed gas cylinders
- Bunsen burners



Lab Equipment

Which picture represents a proper hood?

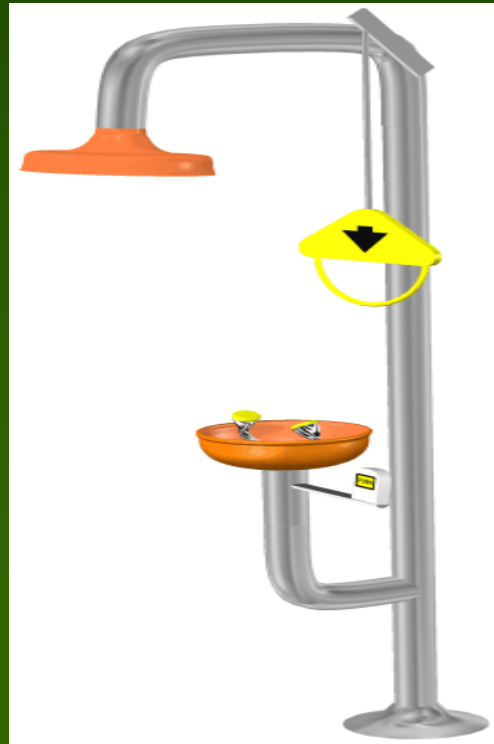


SAFETY EQUIPMENT

- proper equipment must be available
- requires training for the location so individuals know how and when to use equipment appropriately
- training on the correct maintenance & storage is also necessary



SAFETY EQUIPMENT



- FIRST AID AND MEDICAL TRT
- EMERGENCY EQUIPMENT
- SHOWERS, EYEWASH STATIONS
- MSDS'S
- PPE

First Aid and Medical Treatment

- First aid kit available and properly stocked (nothing expired)
- Trained first aid attendant or
- Medical facilities within 15 minutes
- Emergency numbers posted



Emergency Equipment

- Fire blankets
- Fire extinguishers
- Emergency notification system
- Unrestricted means of communication
- Any other emergency equipment needed for your specific laboratory needs

Emergency Showers & Eyewash Stations

- Immediate washing of the skin and eye with generous amounts of water is the most effective first aid treatment for chemical burns (unless chemical reacts unfavorably to water-MSDS)

Emergency Showers and Eyewash Stations

- ❑ must be available
- ❑ showers must be tested for proper operation with results documented



Alternatives to Installed Showers and Eyewashes

- Portable showers or eyewashes
- Attachments that connect to existing faucets
 - must supply at least 15 minutes of continuous water
 - must stay on until turned off

Material Safety Data Sheets, (MSDS)



- required for each chemical
- requires employee and student review
- must be accessible for employees/student

MSDS Information Includes:

- Nomenclature including chemical family and formula
- Hazardous ingredients
- Physical data
- Fire and explosion hazard
- Health hazard
- Spill and leak procedures
- Special protection information
- Storage and handling precautions

Personal Protective Equipment

■ AGENCY MUST:

- Provide PPE for all employees

- ☑ at no cost to the employee

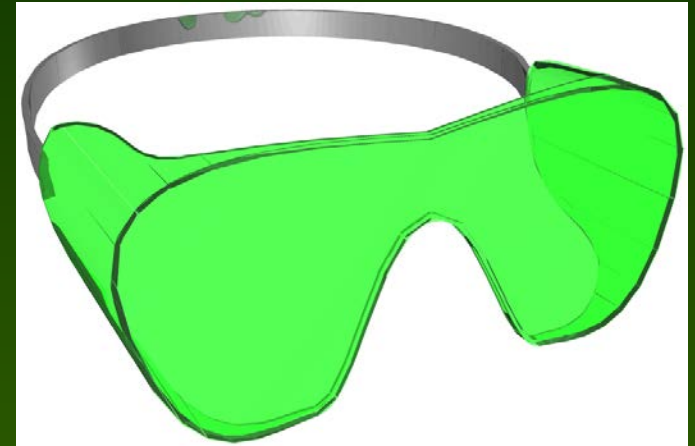
- train employees how to use PPE properly

- train employees on the limitation(s) of PPE

- train employees in proper care, storage, and useful life, and disposal of PPE

Appropriate PPE:

- aprons, lab coats
- gloves-
latex, nitrile, neoprene
- goggles, face shields,
safety glasses
- respirators-full, partial,
dust mask
- noise protection



ELECTRICAL SAFETY

- Protection of employees and equipment
- inspect panels and plugs
- GFIs (specified by code)
- surge protectors
- inspection & reporting programs



DISPOSAL PROCEDURES

- chemical wastes
- organisms, diseases, animals
- glassware
- spills
- sharps



DISPOSAL PROCEDURES

CONT.

- Trained persons designated to handle disposal
- Meet all required rules and regulations
- Proper collection containers
- Waste collection contracts
- Does not expose humans, animals, plants, etc upon disposal - may include decontamination, sterilization, incineration, autoclaving

EMERGENCY RESPONSE PLAN

- agencies should develop an emergency response plan BEFORE an emergency
- review with employees (students) make sure they understand the plan completely

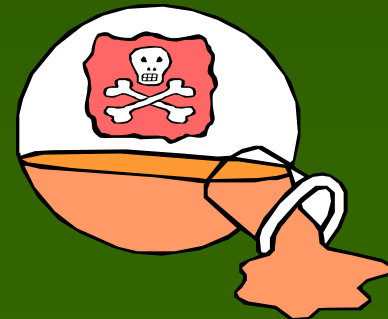
Emergency Response Plan should include:

- recognizing emergencies
- lines of authority
- methods of communication
- safe sites and evacuation routes
- site security and control



Emergency Response Plan should include cont.:

- decontamination procedures
- provisions for medical treatment
- emergency alerting and response procedures
- PPE and emergency equipment for clean-up
- follow up



INSPECTION OF LABORATORIES

- Develop inspection report appropriate for laboratory
- cover all areas related to laboratory
 - personnel practices
 - operational practices
 - equipment
 - emergency protection equipment
 - materials inventory
 - miscellaneous