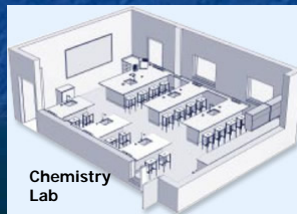
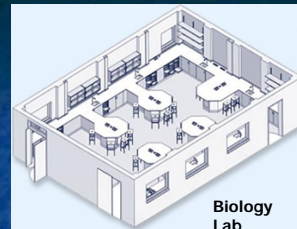


# Laboratory Organization and Maintenance

Vijayshri, IGNOU, India

- ❖ Organisation and Design
- ❖ Day-to-day Management
- ❖ Stock Control , Purchase
- ❖ Files and Records
- ❖ Communication
- ❖ Maintenance
- ❖ Use of Computers



# Organisation and Design

- Needs and Requirements
- Space
- Utilities / Services
- Storage

## Needs and Requirements

- Number of students, teachers and lab staff using the lab space at a given time;
- Furniture, (benches, stools, etc.);
- Storage, (museum)
- Future expansion;
- Seating, Water, gas, electric supply, Office;

- Specialised space (museum, demonstration equipment, instrument room, preparation room)
- Safety measures
- Other rooms,
- Cost effectiveness
- Ventilation, lighting, heating and cooling

## Space Design

- Space per individual: 2m<sup>2</sup>
- Space for work and circulation and bench space
- 2 to 3 workers 6m × 3m

Concept of lab unit.

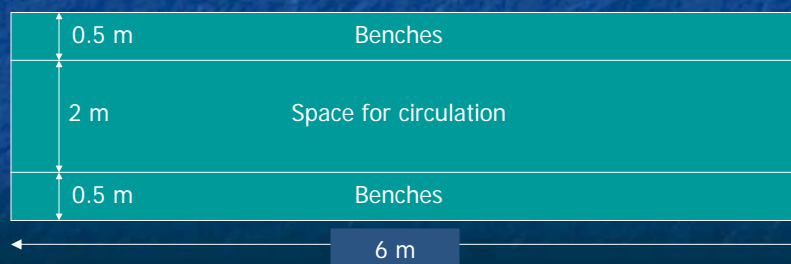


Figure: One arrangement for the 'Lab Unit'

# Design of Laboratories

- Fixed Design – Fixed benches, services
- Flexible Design – Tables, partition walls
- Main lab and other rooms.  
e.g., dark room, preparation room

## Benching, surfaces and furniture Different Lab Layouts



(a) An empty lab



(b) Perimeter and Island benching



(c) Peninsular benching



(d) Perimeter and Peninsular benching

# Ergonomic considerations

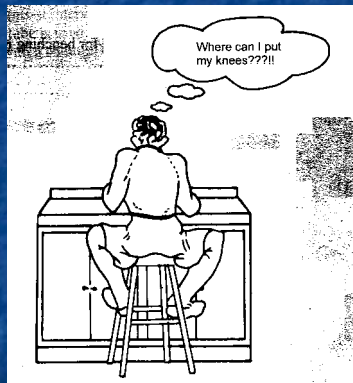
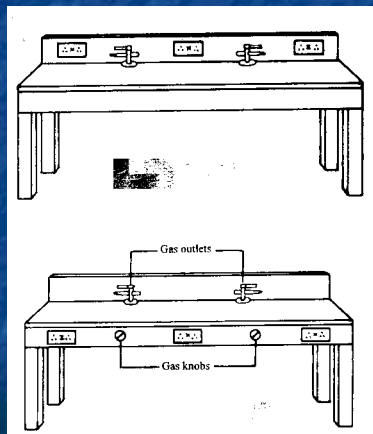


Figure: Knees up while working.

# Services

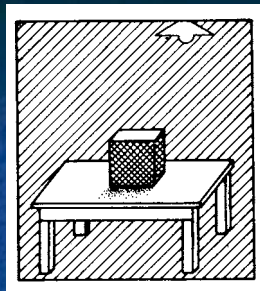
- Electricity, Water and Gas supply



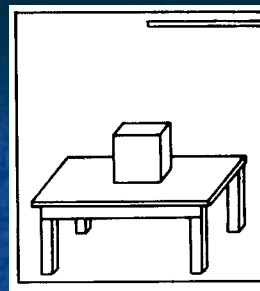
a) Poor positioning of service outlets,

b) services controlled from the front bench.

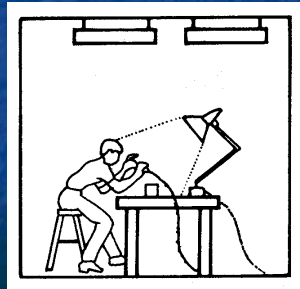
# Water Supply



(a) Standard electric bulbs give rise to harsh shadows



(b) Fluorescent tubes provide more even lighting



(c) Eye straining work requires high levels of illumination

LIGHTING

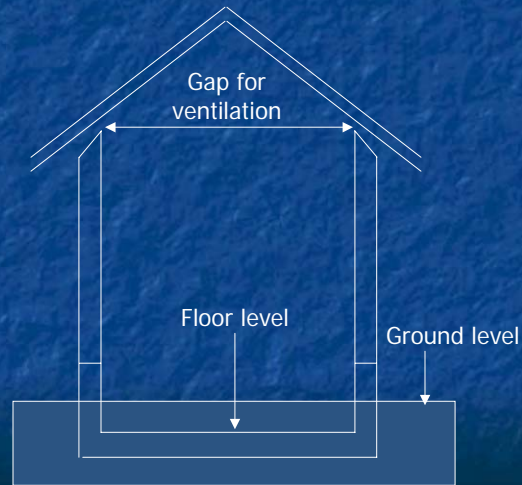
# Biology

## Preparation room:

- Wet bench with running water and drawing board
- A water distillation or deionizing plant.
- Balance (preferably an accurate one and a rough one).
- A large dry bench for dry work like constructing apparatus and for repair work.
- Vice and small hand tools.

- Adequate shelving and cupboards for storage of apparatus, equipment and chemicals as well as adequate storage space for a considerable quantity of paper.
- An area for office work where the teacher or lab attendant could do paper work.
- Adequate electrical outlet sockets.
- Gas supply.
- An efficient waste disposal system.

# Containment and Ventilation



# Storage

What do we need to store?

- Gas
- Chemicals
- Poisons
- Animal and plant specimens
- Material
- Glassware
- Equipment
- Tools

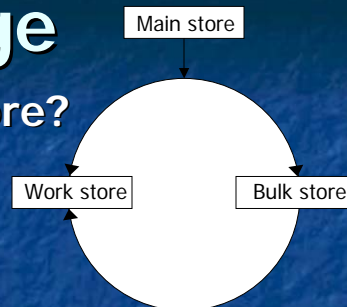


Figure: The primary flow of materials.





## Day-to-day Organisation and Management

- Tidying the Lab and instruments. Setting it up every day, preparations,
- Demonstrations
- Sterilisation
- Winding up
- Waste Disposal,
- Checking supplies,

- **Routine inspection and maintenance**

- **Daily**
- **Weekly**
- **Monthly**
- **Annual**
- **Maintenance of Equipment, furniture**
- **Troubleshooting**
- **Interaction with teachers and students**

## **Emergencies**

- **Fire,**
- **Flooding,**
- **Electric shock,**
- **First aid**

# Security and Vandalism

## Stock Control and Purchase

- Keeping Inventories and records
- Placing Orders and Purchase
- Receipts
- Accounts
  - Contingencies
  - Imprest
- Filing and Records

# Computers in the Lab

- Familiarisation
- Uses
- Packages
- Communication
- Preparing accessories [charts, tables, figures, search, diff. grating, etc.]
- Computer peripherals and maintenance [Monitor, Printer, CPU]