

LABORATORY PRACTICAL ACTIVITIES

Biological Safety Cabinets Hands On Practical

Give description of Lab Practical

This practical will involve two parts. The first part will be a show and tell section. During this part the instructor will speak about how a BSC works. They will then show how to set-up, perform, and clean up a cabinet properly.

The second part involves having the students break into small groups of 2-4. Each person in the group will have a chance to do one of the following: set-up the cabinet, perform work in the cabinet and clean-up the cabinet. While there is one person performing the tasks, their group members will be instructing them on what to do, and how to do it properly.

Aim / Objective

This practical will help students learn how to properly work in a biological safety cabinet safely. By using different props the students will learn the importance of the cabinet and its airflow. They will also learn about contamination, and how to clean it up if it happens.

Methods & Materials

Smoke stick

Pipettes (multi-channel, serological, micro) and tips

96 well plates

15 and 50ml conical

1.5ml screw on &/or snap cap tubes

Tube racks

Red dye

Glow germ (powder) or fluorescent dye

Liquid discard container with lid

Autoclave bags (small and large)

Chemical integrators, or liquid diacks

Tape

Small spray bottle labeled as "disinfectant" filled with water

Lab diaper (bench liner)

Paper towels

Hand held UV light

Time duration

2hrs

Lesson plan / practical plan layout

Background

Class II cabinets -

- Explain Class II cabinets (differences between A2, B2)
- Explain how each type of protection is achieved (smoke stick to emphasize point):
 - Personal
 - Product
 - Environmental
- Importance of placement, and room air currents
- Importance of blower

Operation (walk through process)

- Start up
 - Blower
 - UV
 - Lights
 - Alarms
 - Cabinet cleaning prior to work

Setup – atmosphere (stage cabinet)

- Placing work items in cabinet
- Aerosol generating equipment
- Disinfectant
- Liquid discard
- Biohazard bag (solid waste)
- Absorbent material
- Pre-planning for work to be performed

Work performed in the BSC (stage and show)

- Seat height
- Reduce movement into and out of cabinet
- Slow and steady
- Clean to dirty
- Hand removal
- Waste discard

Upon completion of work (clean and show)

- Agent containers
- Removing work items
- Cleaning prior
- Blower
- Removing liquid and solid waste
- Cleaning after all items have been removed
- Allow blower to run at least 5 minutes after work is complete
- Lights
- UV

Considerations

- NO OPEN FLAMES (turbulence, damage to HEPA filter, fire hazard) If a heat source is required for work, you may use the incinerators for bacteriological loops, etc
- Spills

Part 2 (team exercise)

Working in the Biosafety Cabinet (teams)

- Break into groups of 2-3
- Each group will set-up the cabinet from scratch, one will do what the others tell them to do, going through all the steps that were previously covered
- Partners will switch once set-up

Work performed in the BSC

- Now a new person in the group will show pipetting skills
- Red dye that is mixed with glow germ will be placed in cabinet
- Cabinet will be shown to be clean by UV and visual
- One pipette will secretly be dusted with glow germ
- One will pipette into containers given, and do a drill of some kind, while others watch and tell them what to do
- Once finished, we will show by UV where all the glow germ is
- Person working in cabinet will come out of cabinet aseptically

Upon completion of work

- Last person in group will clean up the cabinet, including all the areas where the glow germ, and red dye are
- Team members will help to advise on what to do, where to spray, order to proceed with each step
- Upon completion, the cabinet will again be looked at with UV to see effectiveness
- If time permits, each of the team members can perform this “test” for themselves