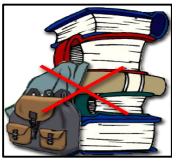




Micro Lab Safety Rules

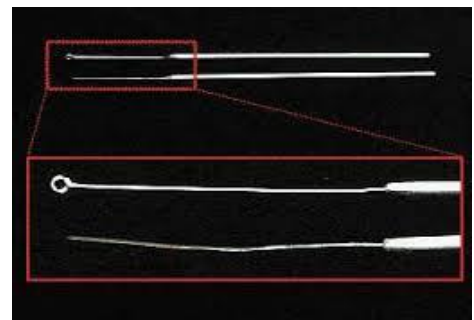
In the microbiological laboratory there are many hazards; however, most problems and accidents can be prevented by following the rules :-



- 1- Conduct yourself in a responsible manner at all times in the laboratory.
- 2- Wear a lab coat and lab coat, in the lab. ,but remove it before leaving to avoid spreading organisms throughout the building or in to your home .
- 3- Do not eat food, drink beverages, or chew gum in the laboratory. Do not use laboratory glassware as containers for food or beverages.
- 4- Remove dangling jewelry and items such as scarves and ties .
- 5- Do not place your personal items on the lab bench .
- 6- Keep hands away from face, eyes, mouth, and body while using chemicals or lab equipment. Wash your hands with soap and water after performing all experiments.
- 7- Disinfect your lab bench before you start, if you spill culture, and before you leave the lab. Work areas should be kept clean and tidy at all times.
- 8- Dispose of all chemical waste properly. Never mix chemicals in sink drains. Sinks are to be used only for water.
- 9- Lab equipment is expensive and sensitive ,Please handle equipment gently and do not be afraid to ask for instruction on the use of any equipment .
- 10- Be aware of your Bunsen burner at all times when it is in use .

Equipment used in microbiology

- 1- **Microscope:** is the most common instrument used in microbiology laboratories, where the magnification assist to detect microorganisms and other objects that cannot be seen by naked eye.
- 2- **Autoclave:** used for sterilization of glass ware and media.
- 3- **Incubator:** a device used to grow and maintain microbiological cultures or cell cultures.
- 4- **microbiological safety cabinet(Biological hood) :** is an enclosed, ventilated laboratory workspace for safely working with materials contaminated with pathogens requiring a defined biosafety level .
- 5- **Sensitive electronic Balance :** is an electronic apparatus used for the precise measurement of materials and media .
- 6- **Bunsen burner:** is a common piece of laboratory equipment that produces a single open gas flame, which is used for heating, sterilization, and combustion.
- 7- **Inoculation loop and Needle:** used to inoculate test samples into culture media.
- 8- **Petri dish/agar plate:** is a shallow glass or plastic cylindrical lidded dish that biologists use to culture cells, and it act as a supporting container to hold the culture medium in.



Microbiology : is the science that deals with the micro-organisms that can not be seen with the naked eye, so the microscope is the means by which to enlarge the small things that can not be seen with the naked eye . there are several types of microscopes used in the laboratories such as :

1-Compound Light Microscope

Uses light rays which are magnified and focused by means of lenses. This type is used to examine tiny or thinly sliced cross sections.

2- Dark field Microscope

This is similar to the ordinary light microscope; however, the condenser system is modified so that the specimen is not illuminated directly. The condenser directs the light obliquely so that the light is deflected or scattered from the specimen, which then appears bright against a dark background. Living specimens may be observed more readily with dark field than with bright field microscopy.

3- Phase-Contrast Microscope

The contrast between the transparent specimen and the surrounding back ground is increased while the transparency of the specimen remains unaltered.

4- Fluorescent Microscope

This microscope is used most frequently to visualize specimens that are chemically tagged with a fluorescent dye. The source of illumination is an ultraviolet (UV) light. The fluorescent dyes (such as Auramine O, Acridine Orange and Fluorseen) absorb at wavelengths between 230 and 350 nanometers (nm) and emit orange, yellow, or greenish light. This microscope is used primarily for the detection of antigen-antibody reactions.

5- Electron microscope (EM)

This microscope is a type of microscope that uses an electron beam to illuminate a specimen and produce a magnified image.

The electron microscope uses electrostatic and electromagnetic lenses to control the electron beam and focus it to form an image. These electron optical lenses are analogous to the glass lenses of a light optical microscope.

Compound Light Microscope Parts & Functions

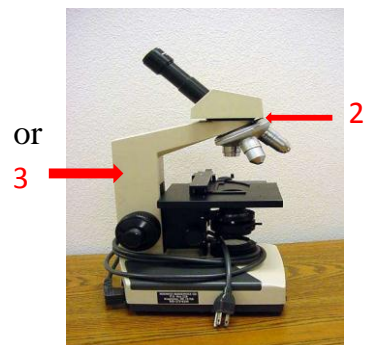
1- Eyepiece:

- Magnifies material being viewed by 10X .
- The part of the microscope you look into .
- Sometimes contains a pointer that can be seen as you look into the eyepiece.
- May also be called the **ocular**.



2- Nose piece:

- Part of microscope to which the objectives are attached .
- Rotates to allow for the changing of objectives to increase or decrease magnification.

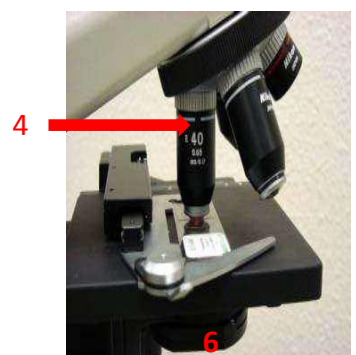


3- Arm:

- Part of microscope to which the nosepiece is attached .
- A secure part of the microscope to hold on to when the microscope is being transferred ..

4- Objectives:

- Magnify material being examined
- Scanning magnifies 4X, 10X, 40X, Oil immersion magnifies 100X
- **Total magnification** = magnifying power of eyepiece x The magnifying power of the objective in use.

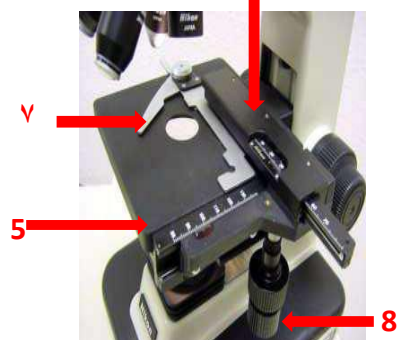


5- Stage:

Platform on which microscope slide rests .

6- Mechanical Stage:

- Used for adjusting the position of the slide for viewing .



7- Slide holder:

- Secures slide to the mechanical stage .

8- Mechanical Stage control knobs:

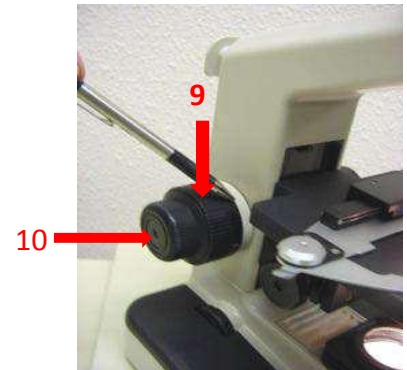
- Move the slide .

9- Coarse adjustment knob:

- Coarse focusing .

10-Fine adjustment knob:

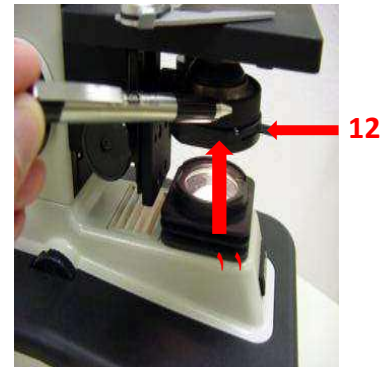
- Precise focusing .

**11-condenser**

- concentrates light & directs it through opening in microscope stage.

12-Iris diaphragm:

- regulates the amount of light passing through the substage condenser .
- increases resolving power of the microscope .

**13-Illuminator**

- Light source

14-Illuminator control:

- Controls the intensity of light .
- Serves as the on/off switch for some microscopes

15-Base:

- provides support for microscope .

