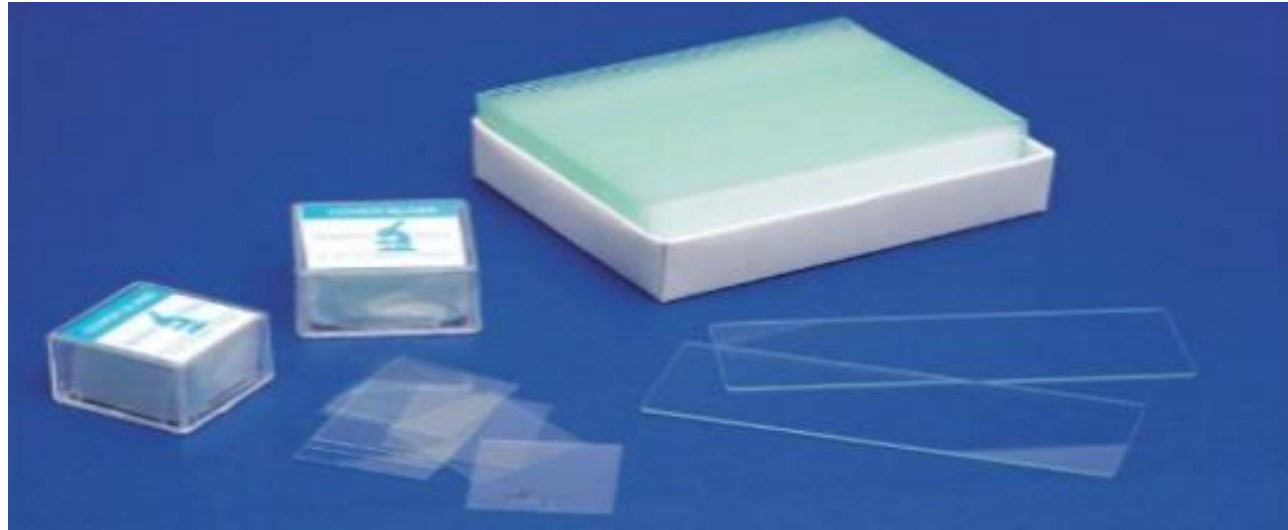


# Laboratory Equipments and Materials

Prof.Dr.Sewgil S.Anwer

# Materials

-**Glass slide:** used to place specimen on to observe under the microscope



- **Cover slip:** used to cover specimen on a microscope slide.

## 2. Petri dish

- Used for isolation and cultivation of different types of M.O in all microbiological laboratory.
- Disposable sterile plastic petri dishes are also available for same purpose.



## Pipet and graduated cylinders

- Glass or plastic
- Used to **measure and transfer liquid volume**
- Graduated in ml or micromil.



Graduated Cylinders



Pipet

## Funnel

aids in pouring liquids into small openings without spilling them.



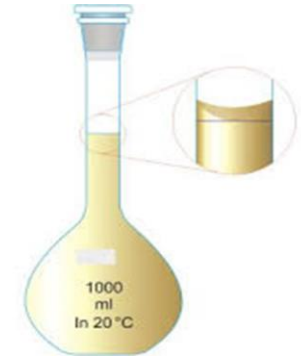
## Erlenmeyer or conical flask

- It is used for preparation of media
- It must be sterilized before microbiological usage



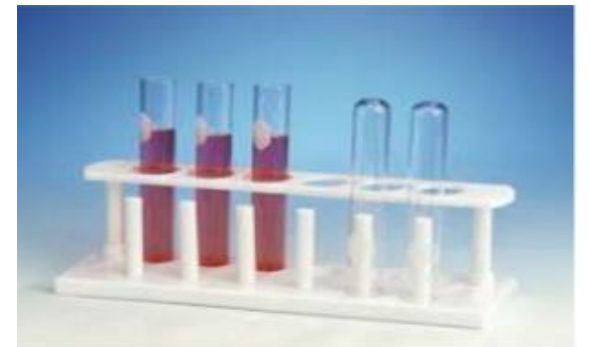
## - Volumetric flask

It is used to prepare solution of **accurate strength**.



**Test tube:** used to mix, heat or store substances and cultures

**Test tube rack:** used to hold test tube



## **Washing bottles:**

used to rinse various pieces of laboratory glassware, such as test tubes and round bottom flasks and staining

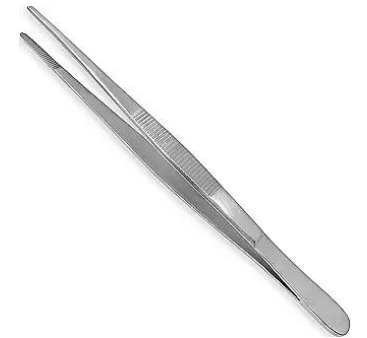
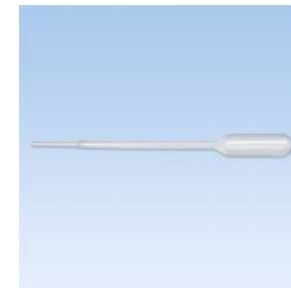


**Filter paper:** special paper used to separate solids from liquids.



**Forceps:** used to collect small organisms

**Dropper:** transferring small volumes of liquids



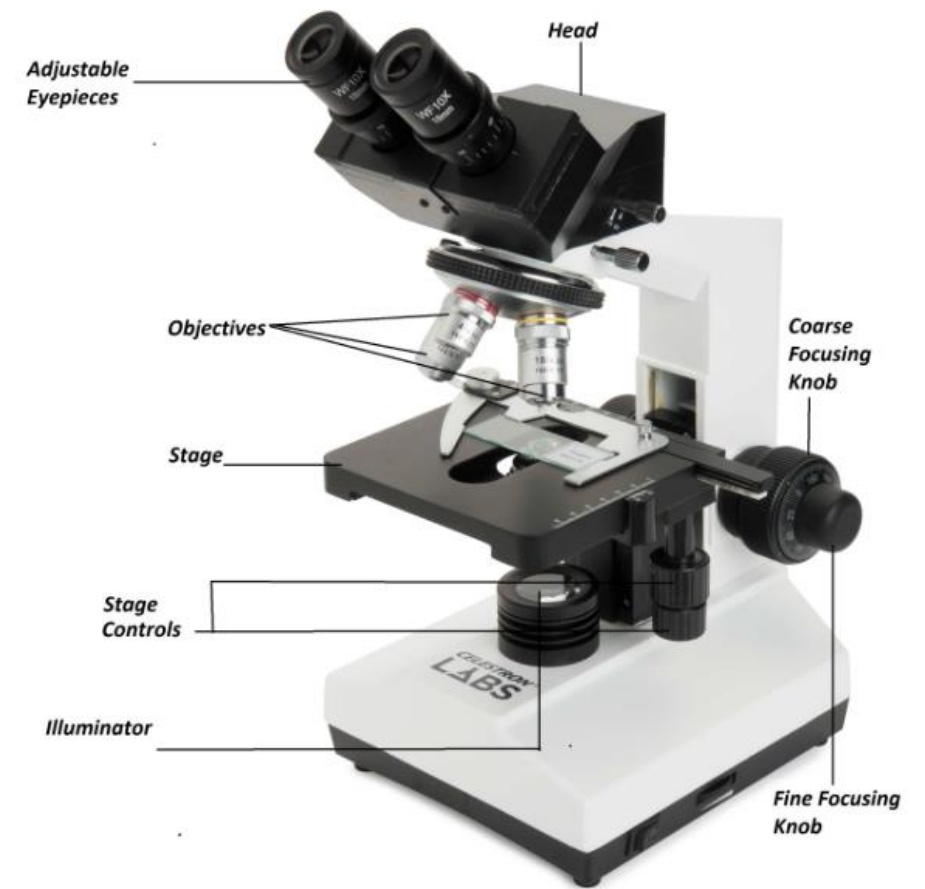
**Q/Write the purpose of using the following items**

Petri dishes	Microbial culture
Forceps	Collect small things( organism)
Conical flasks	Preparation of medium, solution
Pipet	Transfer small amount of liquid( microorganism in liquid medium)
Funnel	Pouring liquid into small opening
Volumetric flasks	prepare solution of accurate strength
tubes	Heat, store culture
Filter paper	filtration
dropper	Dropping small amount of liquid
Washing bottle	Rinse the tube and in staining procedure
slide	Place specimen on

# Lab. Equipments

## Microscope

Simple, Electron, fluorescence microscop







# How to use a microscope

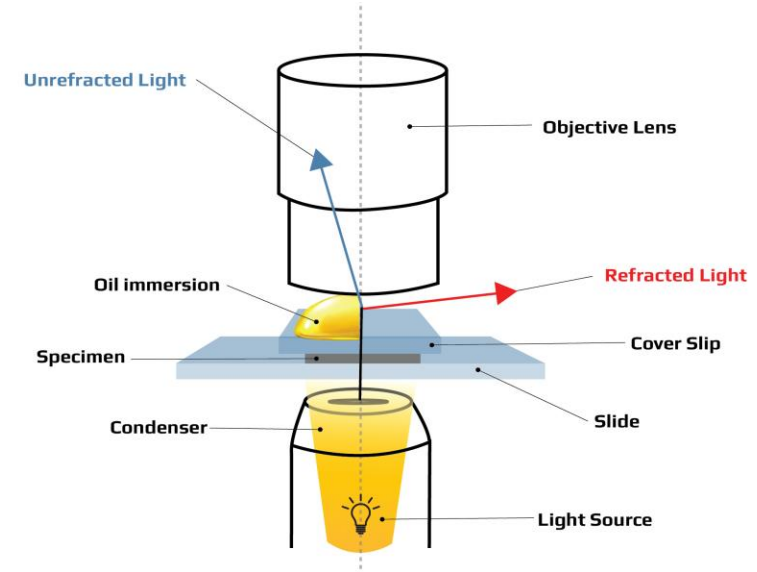
- Place the slide on the stage
- Use stage clips to secure slide
- Adjust nosepiece to lowest setting  
(Lowest = shortest objective)
- Look into eyepiece
- Use coarse focus knob

**process of using the oil immersion lens:**

[Apply a small drop of oil](#) directly on the slide over the specimen.

[Rotate 100x objective into the immersion oi](#)

- Three important rules attend the use of this lens:
1. Never use an oil immersion lens without the oil.
  2. Never get oil on any other lens.
  3. Clean up all oil when finished.



## For information

**Total Magnification:** To calculate the total magnification when looking through the microscope, you multiply the magnification of the **objective lens** by the magnification of the **ocular lens** (usually **10x**).

•For example, with a 4x objective and a 10x ocular lens, the total magnification is:

$4x \times 10x = 40x$  total magnification  
 $4x \times 10x = 40x$  total magnification

•Similarly, for a 10x objective lens:  $10x \times 10x = 100x$  total magnification  
 $10x \times 10x = 100x$  total magnification

# Lab. Equipments

## Incubator

- is a device used to **grow and maintain microbiological culture.**
- The incubator maintain optimal temperature, humidity and other conditions such as the carbon dioxide (CO<sub>2</sub>) and oxygen content of the atmosphere inside.
- **The temperature of incubator is constantly maintained at 37°C.**



### 3. Autoclave

- An autoclave is a pressure chamber used to sterilize equipments and supplies by subjecting them to high pressure saturated steam at and contents. **121°C for around 15-20 minutes depending on the size of the loads**
- **Used to sterilize culture media, discard and other equipments.**
- **All microorganisms and their endospores are killed within autoclave.**



**Oven:** used for Drying and sterilization of glassware and glass tube, Petri dish, flask, ect.....

- The temperature is about 150-180 for 1-2 hr.



**Laminar Flow Hoods or Biological Safety Cabinets:** used for subculture from old cultures the hood consist of a chamber made of wood and steel , provided with a U.V light.



# Laboratory refrigerator

Is used for a wide variety of purposes such as:

1. Maintenance and storage of stock culture between subculturing periods.
2. Storage of sterile media to prevent dehydration.
3. Also used as repository for thermolabile solution, antibiotics and serums.



# 7. Centrifuge

Is an apparatus that rotates at high speed and **separate substances of different densities.**



**Vortex** : Mix and blend ( mix) sample or liquid solution



**Vortex Mixer**



# Lab. Equipments

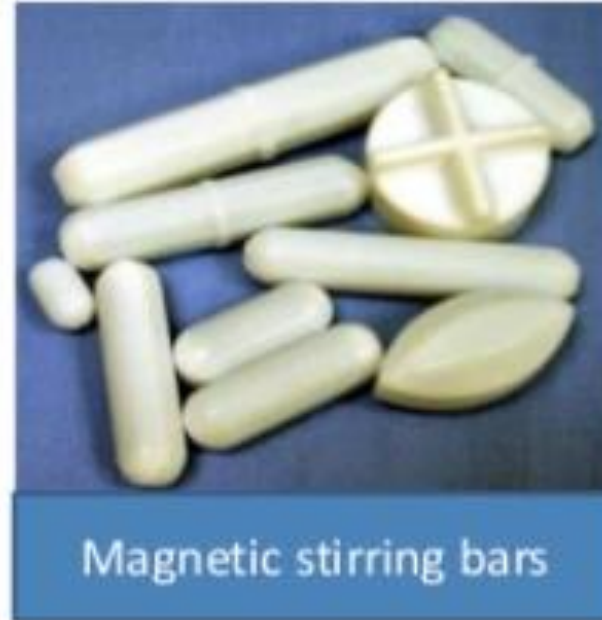
## Balance

Used to measure an object's mass to a very high degree of precision.



# Hot plate/ Stir plate

- used to heat and stir substances.



# Lab. Equipments

- Keep and maintain the temperature
- Melting of solid medium
- Some time for incubation

## Water bath

is a device that maintains water at a constant temperature.

It is used in the microbiological laboratory for incubations.



# Bunsen burner

Is a common piece of lab. Equipment that produce a single open gas flame, which is used for **heating and sterilization**.



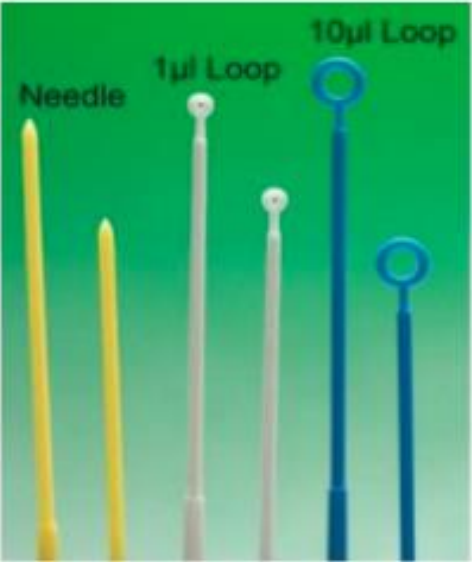
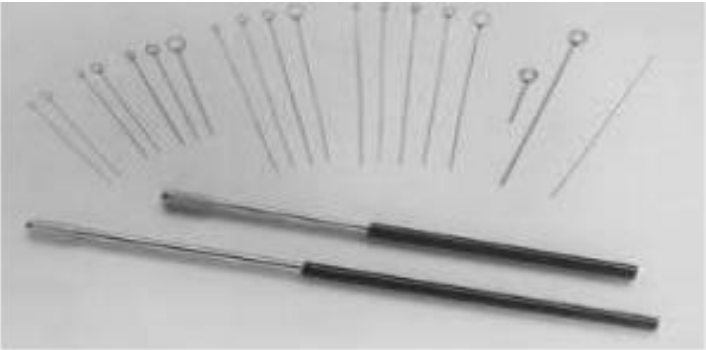
# Inoculating loops and needles

**Inoculating loops** are used to transfer microorganisms to growth media or for staining slides.

Inoculating **needles** are straight wires used to pick up bacteria from closely packed colonies or to inoculate in a very defined area



- Inoculating loops and needles



# Anaerobic jar: Cultivation of anaerobic microorganism



# Spectrophotometer :

- Measure the differences in color intensities of solutions.
- In microbiology lab it used **for counting of bacteria in suspension**





# pH meter:

It is used to determine the pH of the media .

Is used especially in the preparation of stock solutions and the culture media.



Q/ Write the methods that used to sterilize the following items:

Soil- autoclave

Medium- autoclave

glass ware: Oven, Autoclave

antibiotic: filtration

Loop: Burner

vitamin: Filtration

enzyme: Filtration

old culture: Autoclave, Oven

### Multiple-Choice Questions (MCQs)

1. Which microscope is used to view very small microorganisms, such as viruses?

- A) Light Microscope
- B) Electron Microscope
- C) Phase Contrast Microscope
- D) Fluorescent Microscope

2. What is the primary purpose of an autoclave in a microbiology lab?

- A) To culture bacteria
- B) To sterilize equipment and media
- C) To measure cell concentration
- D) To enhance specimen contrast



THANK YOU FOR  
YOUR LISTENING

DO YOU HAVE  
ANY QUESTIONS?