



Tools in Microbiology Laboratory

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Course: Microbiology (MA 211)

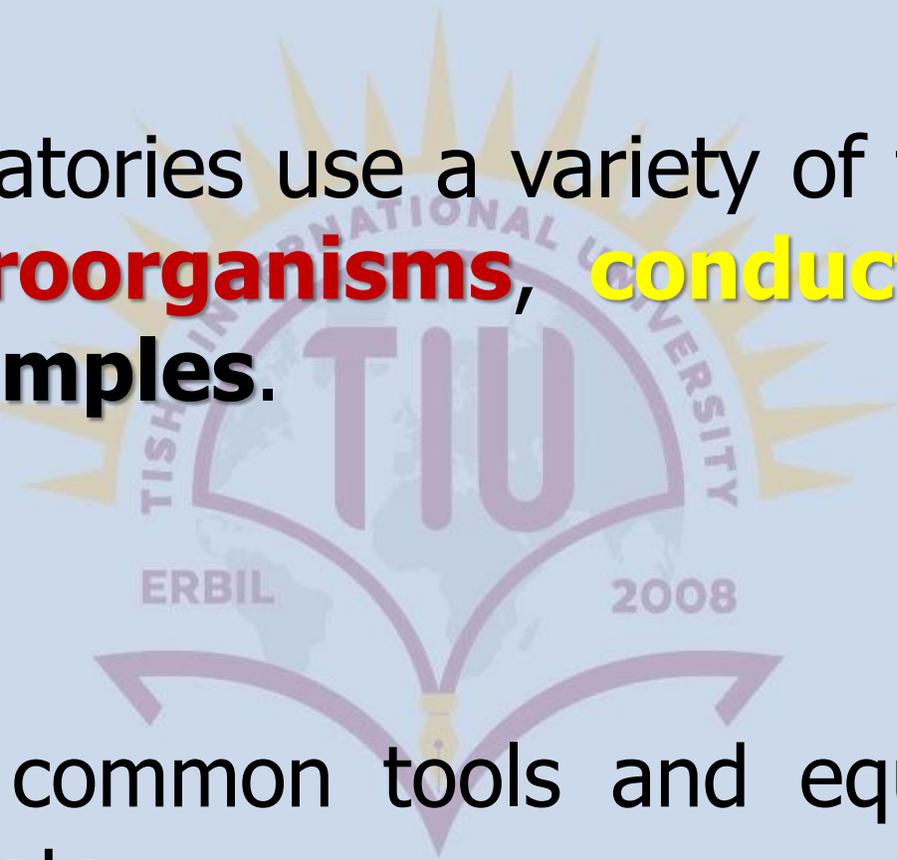
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■ Tools in Microbiology?

- Microbiology laboratories use a variety of tools and equipment for studying **microorganisms**, **conducting experiments**, and **analyzing samples**.
- Here is a list of common tools and equipment found in a microbiology laboratory:



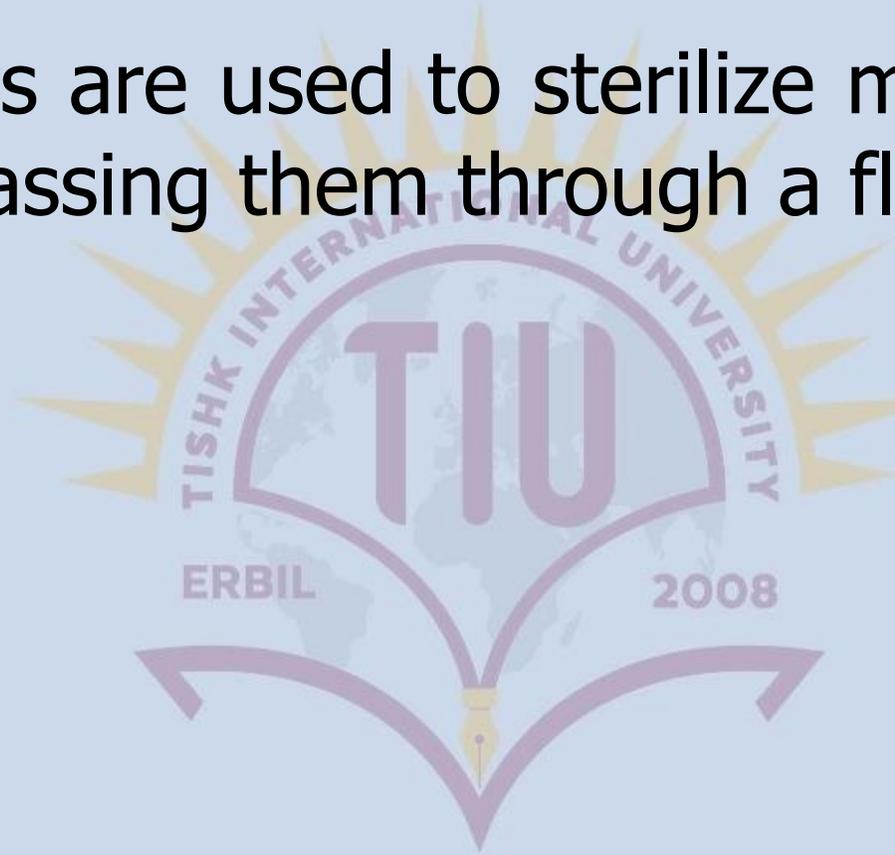
- Inoculation Needle & Inoculation Loop.

- ✓ These are used to transfer microorganisms from one culture to another or to streak samples on agar plates.
- ✓ Even smaller amount of liquid culture can be manipulated by using straight needle.



- Bunsen Burner.

- ✓ These gas burners are used to sterilize metal inoculating loops and needles by passing them through a flame.



- Water Bath.

- ✓ Water bath is an instrument that is used to provide constant temperature to a sample.
- ✓ It consists of an insulating box made up of steel fitted with electrode heating coil.



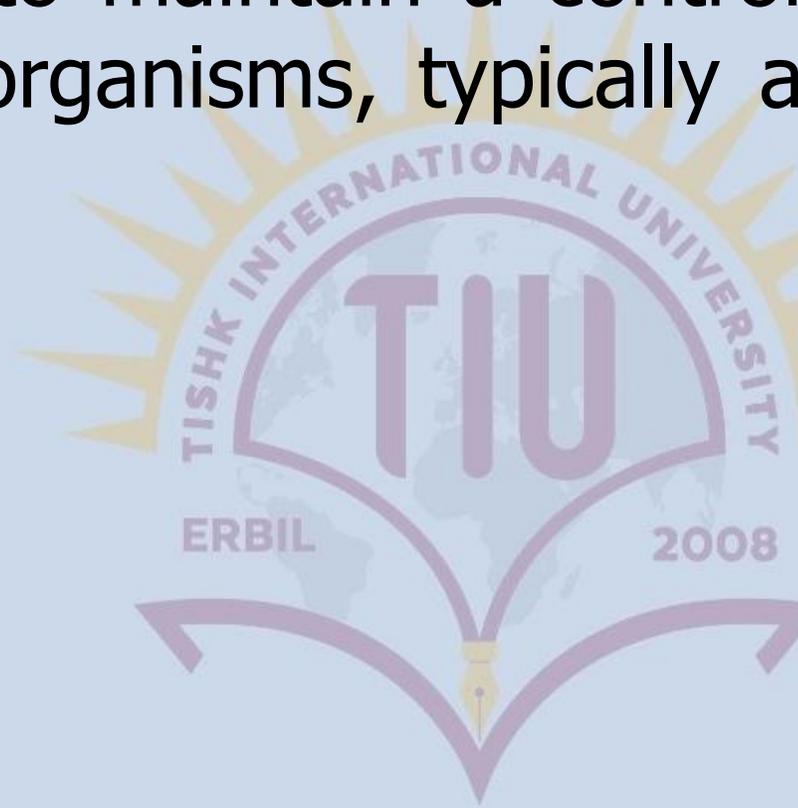
- Laminar Air Flow Chamber.

- ✓ Is an apparatus consists of an air blower in the rear side of the chamber.
- ✓ There is a special filter system of high efficiency particulate air filter which can remove particles as small as 0.3 μm .



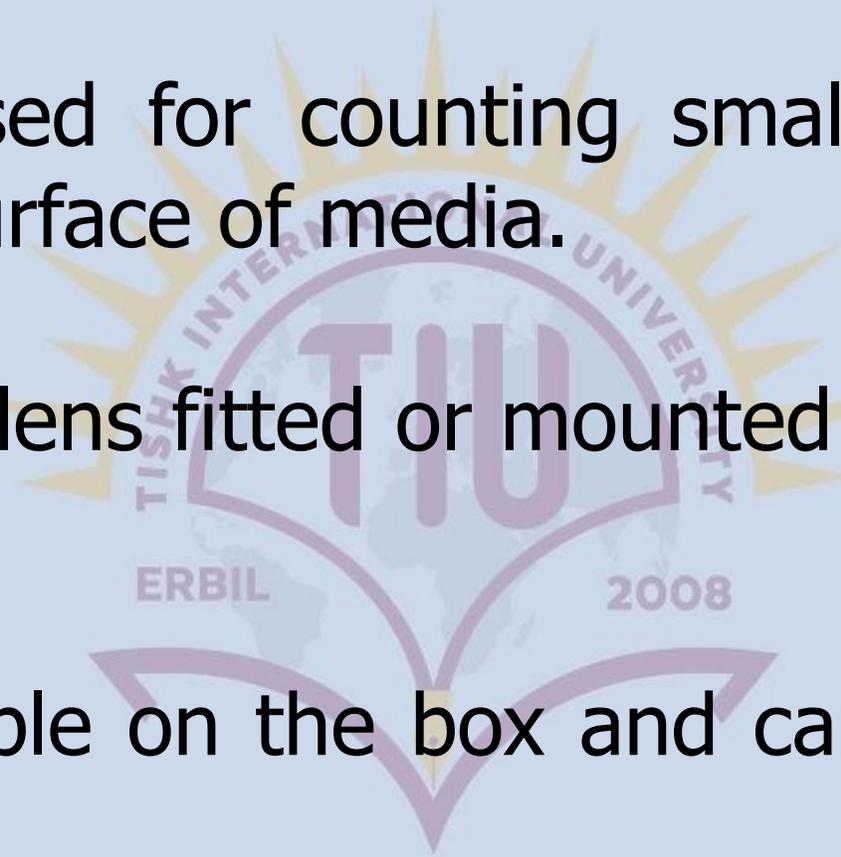
- Incubator.

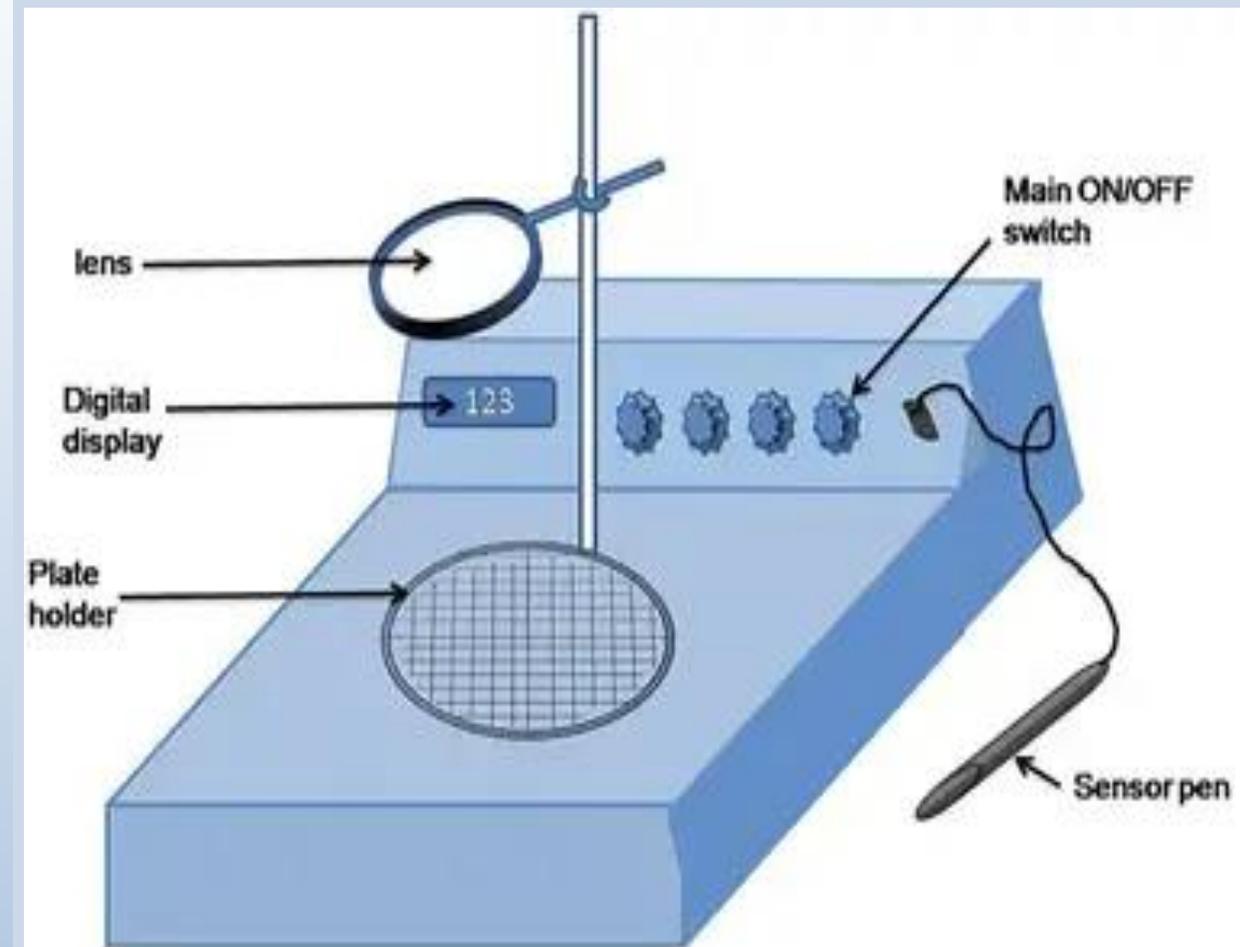
- ✓ These are used to maintain a controlled temperature for the growth of microorganisms, typically at 37°C for bacteria and 25°C for fungi.



■ Colony Counter.

- ✓ It is a device used for counting small or closely growing colonies on the surface of media.
- ✓ For accuracy, the lens fitted or mounted in it helps to see the colonies.
- ✓ The lens is movable on the box and can be adjusted to see the colonies.





■ The Microscope.

- ✓ A good microscope is an essential tool for any microbiology laboratory.
- ✓ There are many kinds of microscopes but the type most useful in diagnostic work is the compound microscope.



- Autoclaves.

- ✓ Autoclaves are used to sterilize equipment, media, and culture vessels by subjecting them to high-pressure steam at temperatures above 121°C.



- Petri Dishes.

- ✓ Petri dishes are shallow, flat, cylindrical lidded dishes used for growing microorganisms on solid agar media.



- Refrigerators and Freezers.

- ✓ These are used for storing culture stocks, reagents, and samples at specific temperatures to preserve their viability.



■ Centrifuges.

- ✓ Are used to separate components of a sample based on their density through rapid spinning.
- ✓ They are essential for cell pellet formation and various biochemical assays.



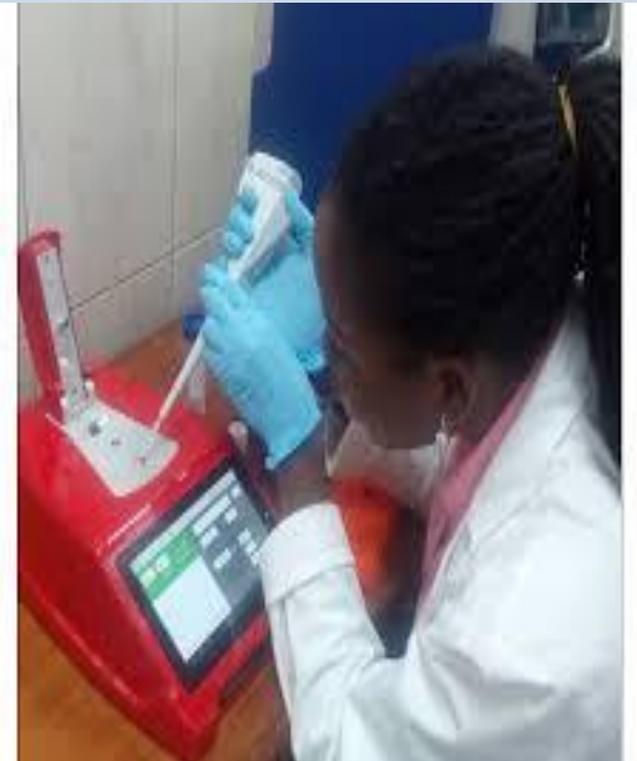
- pH Meters.

- ✓ Are used to measure the acidity or alkalinity of liquid solutions, which is crucial when preparing culture media.



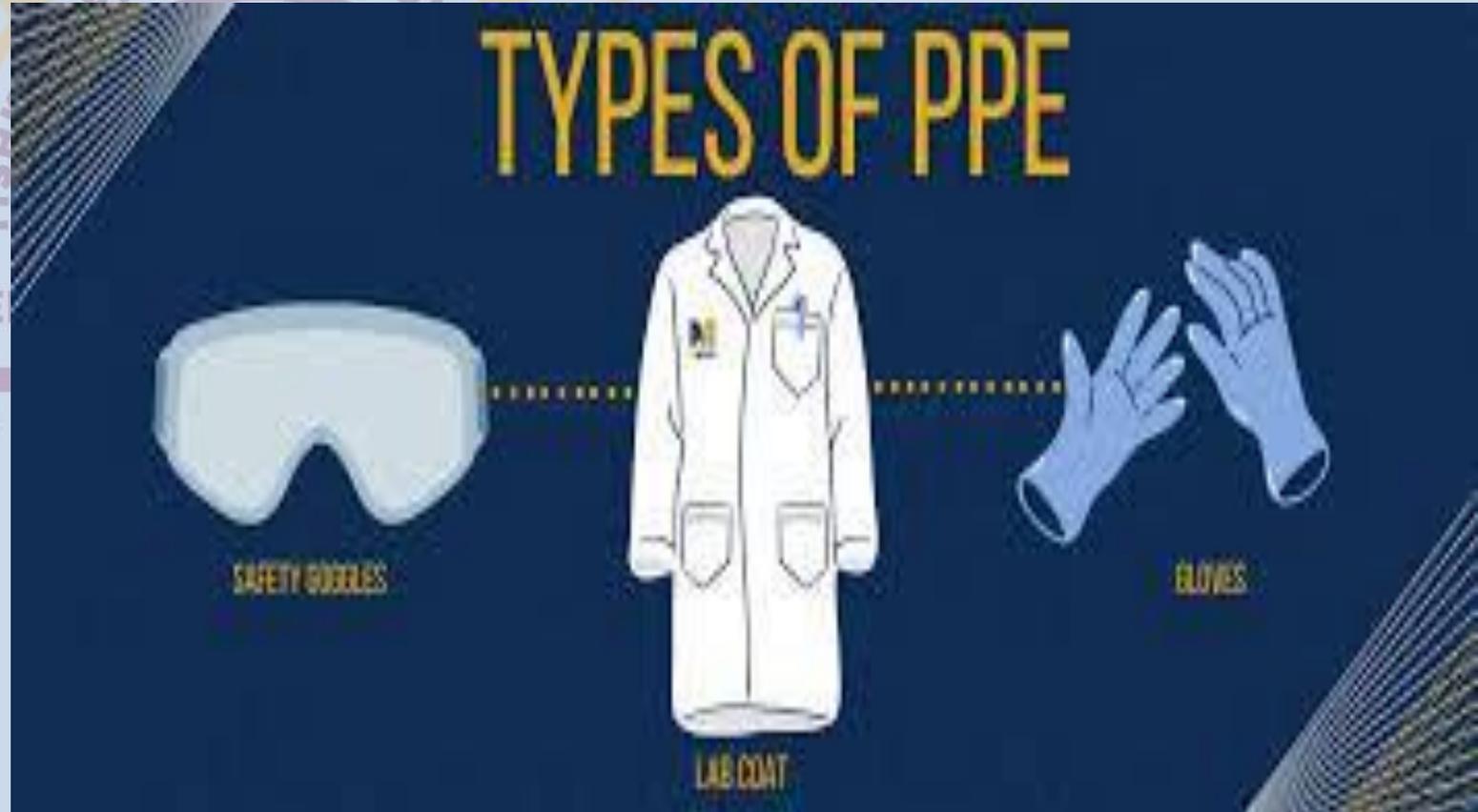
- Spectrophotometers.

- ✓ These instruments are used to measure the absorbance or optical density of microbial cultures to estimate cell concentration or assess growth.



- Safety Gear.

- ✓ Personal protective equipment (PPE) like lab coats, gloves, safety glasses, and masks are essential for protecting laboratory personnel.





References

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- Pepper, I. L., Gerba, C. P., & Brendecke, J. W. (1995). Environmental microbiology: a laboratory manual. Academic Press..



Thanks