Pakistan School
Kingdom of Bahrain

Pakistan School, Kingdom of Bahrain.

Welcome to new class

Grade 11

Rules of the class

1) Be on time for all your classes.
2) Respect all the participants of the class.
3) Do not create any disturbance.
4) Pay attention to your teacher.
5) Raise hand if you have a question.
6) Enter into the class with your actual name and CPR number.

Chapter 1

Cell Structure and Function

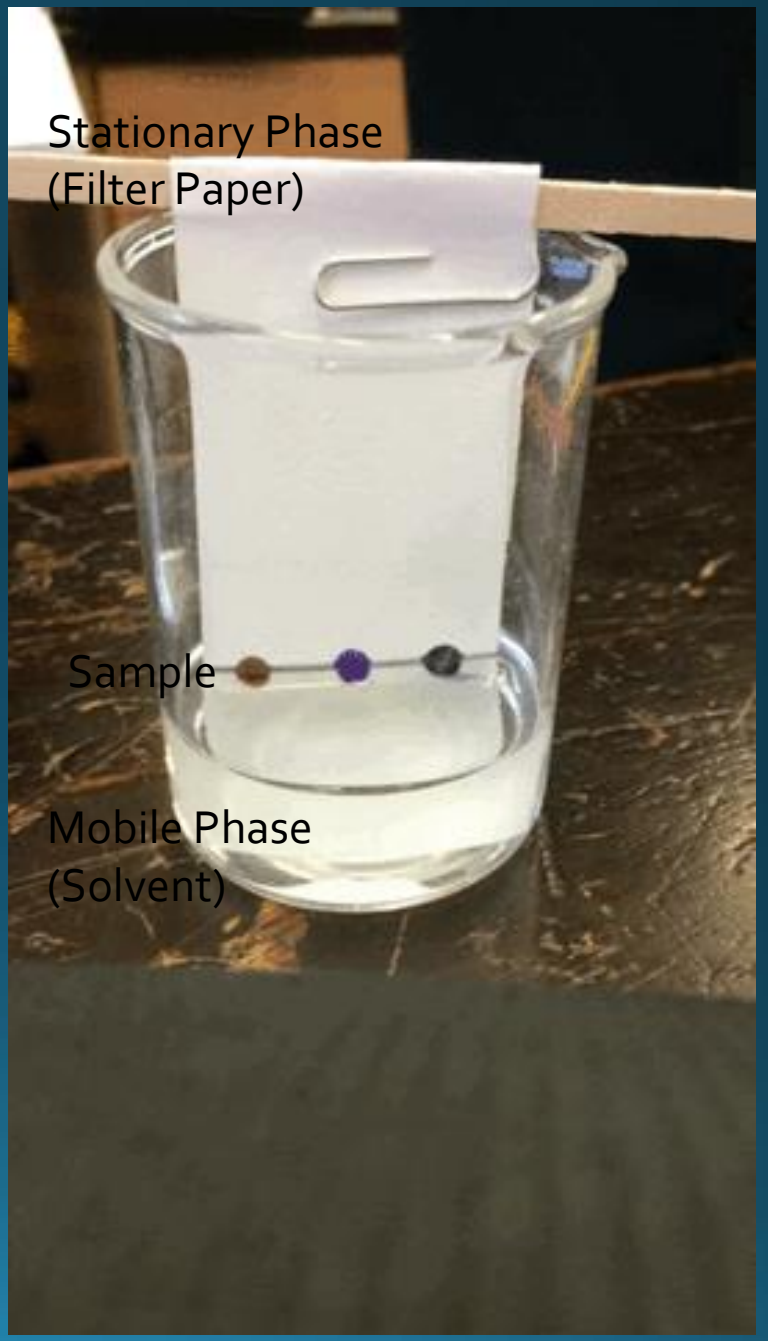
OBJECTIVES:

At the end of this lesson students will be able to:

- Describe the mechanisms of Chromatography, Electrophoresis and Spectrophotometry by identifying their components.

5.CHROMATOGRAPHY:

- A technique that separates different chemical compounds from a mixture
- a technique for the separation of a mixture by passing it in solution or suspension through a medium in which the components move at different rates.
- Usually mixtures of proteins, amino acids or photosynthetic pigments.



Paper chromatography

- Two phases

1) Stationary Phase – consists of **filter paper**

2) Mobile Phase – consists of **solvent** containing mixture sample

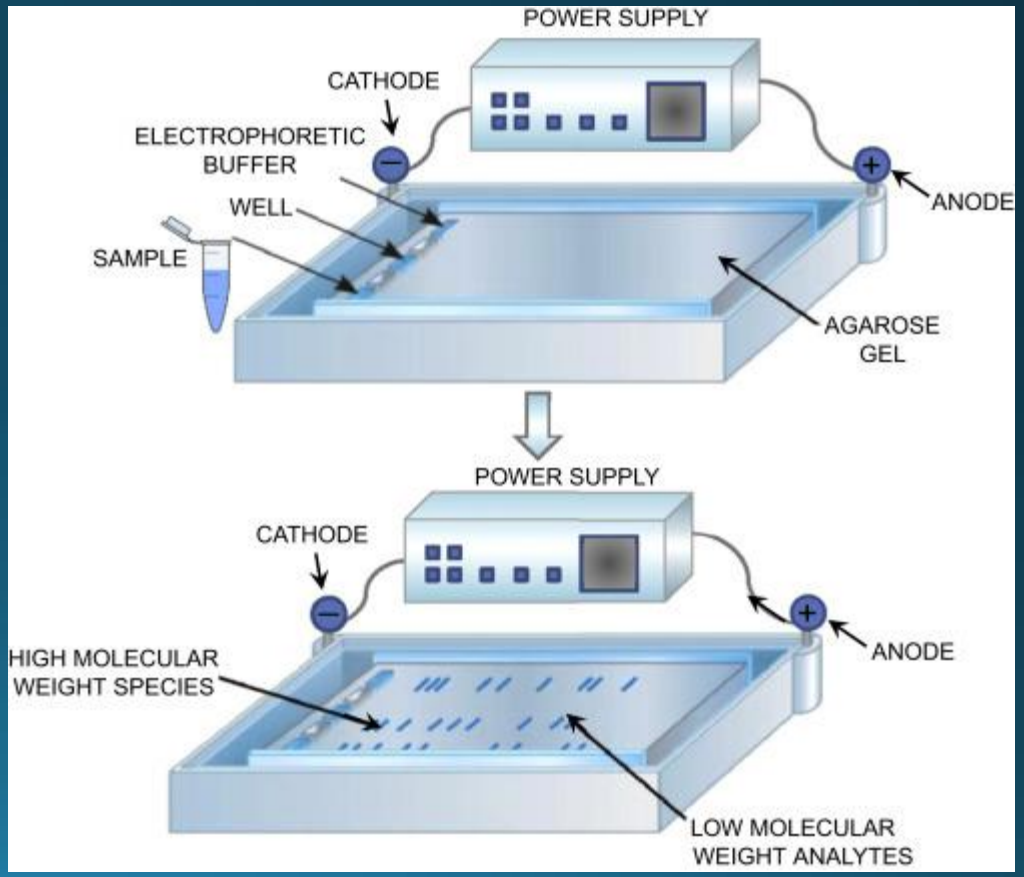
- Process – The mobile phase passes through the stationary phase, molecule of mixture sample present in mobile phase separate on stationary phase as invisible dots according to individual affinity. Then filter paper is sprayed with staining dye to make the dots visible.
- Filter Paper → Chromatogram
- Apparatus → Chromatography chamber

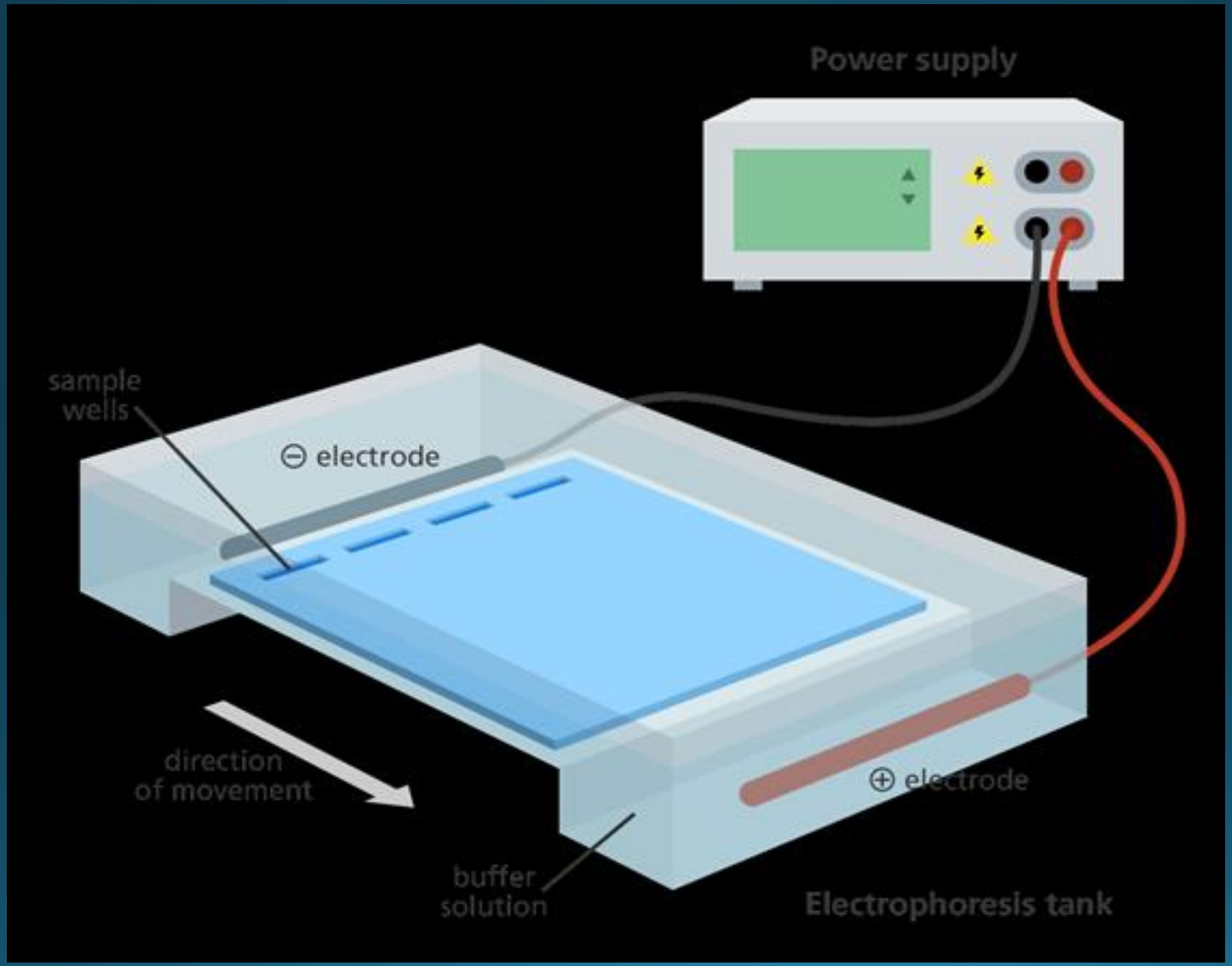
6.ELECTROPHORESIS:

- A technique to separate fragments of a charge bearing polymer molecule according to their size, shape , molecular weight and surface charge.
- Example: DNA, RNA, Protein etc.

Components of apparatus:

- Glass or plastic plates
- Gel medium → agarose or polyacrylamide
- Electric field source (Power supply)
- Salt solutions



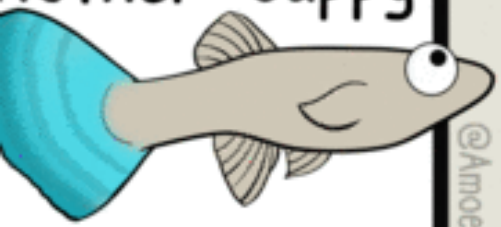

Power supply
sample wells
⊖ electrode
direction of movement
⊕ electrode
buffer solution
Electrophoresis tank

Gel Electrophoresis

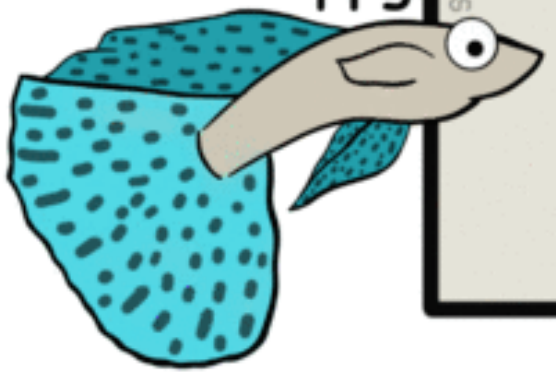
@AmoebaSisters

Baby Guppy

Mother Guppy



Father Guppy



@AmoebaSisters

7. SPECTROPHOTOMETRY:

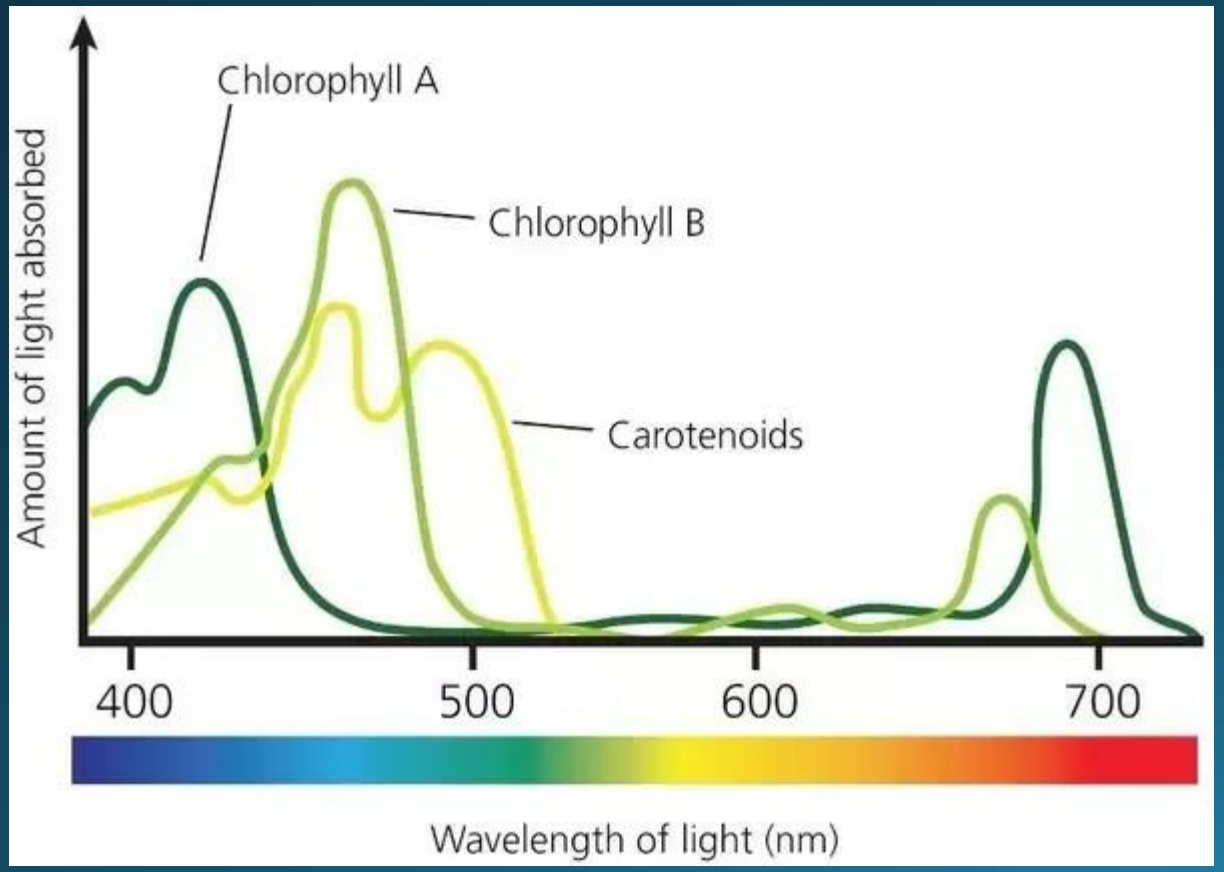
- **Def**: A technique to determine the absorption of different wavelength of light by a particular chemical compound or a photosynthetic pigment.

- Apparatus = **Spectrophotometer**
  - Measures the amount of light that passes through a sample
  - Calculates the amount of light absorbed

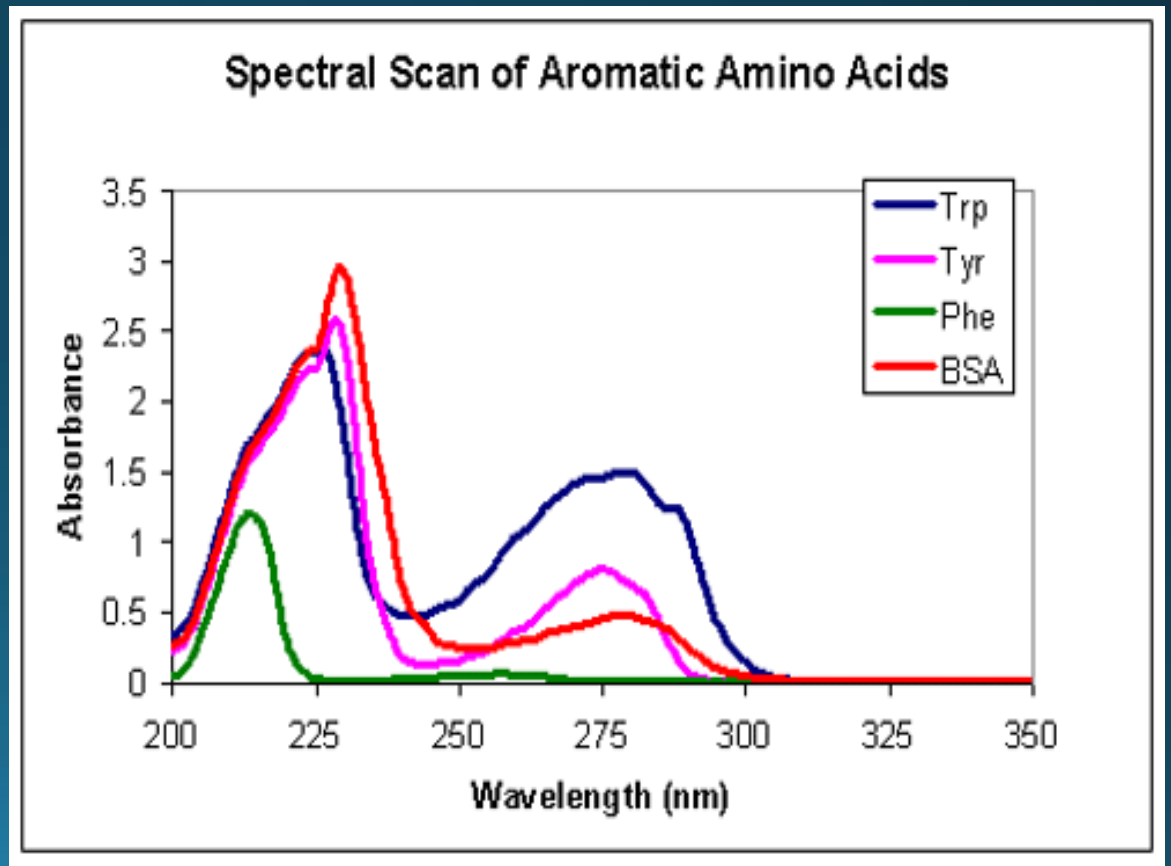
- Result = Absorption Spectrum

  - A graph that shows absorption of different wavelength of light by a particular pigment.

Absorption Spectrum of Photosynthetic pigments



Absorption Spectrum of Amino acids



RESOLUTION AND MAGNIFICATION IN MICROSCOPY:

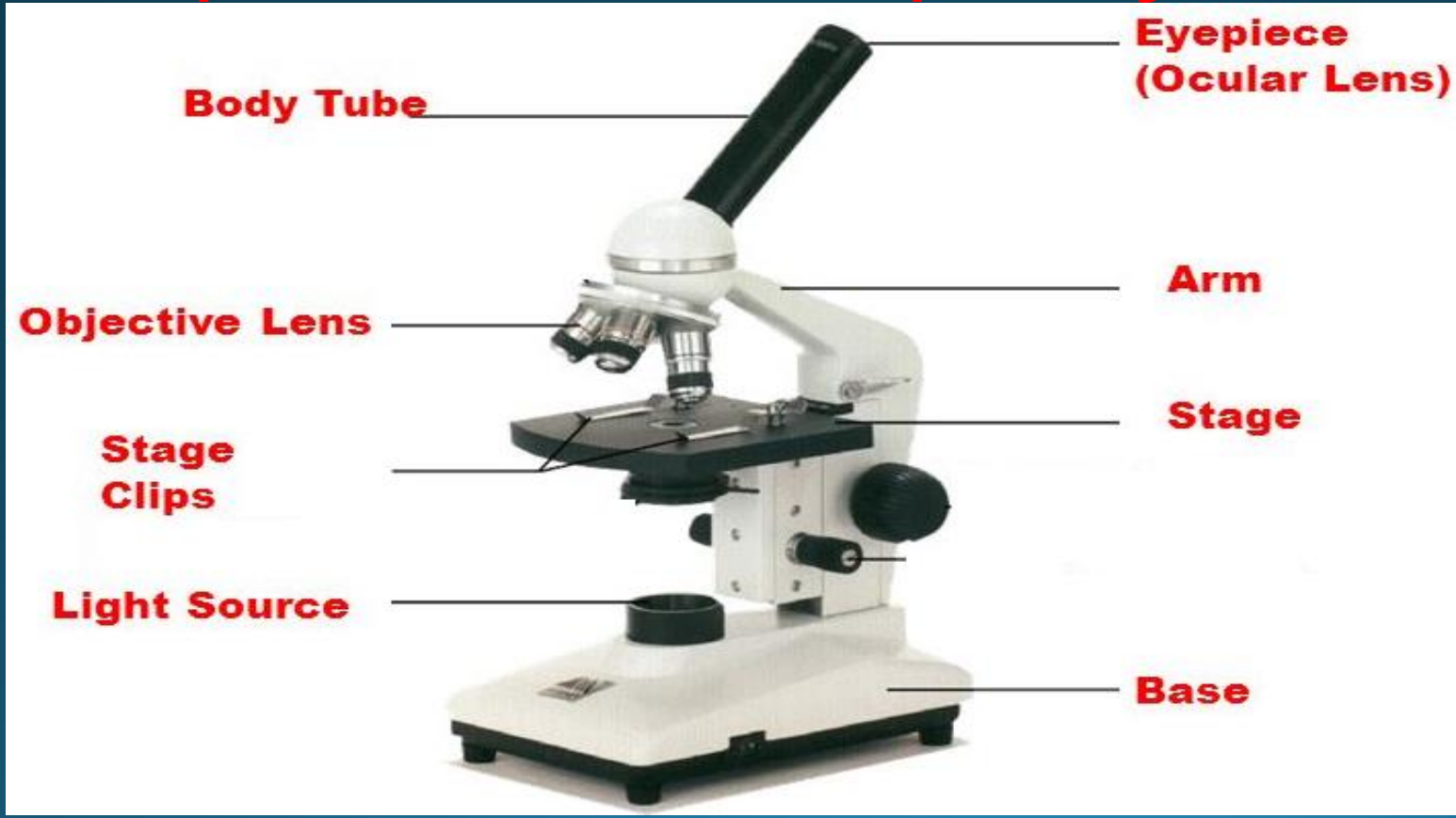
- **Resolution:** The minimum capacity of a lens to differentiate between two adjacent points is called resolution power of a lens.

- **Magnification:** The capacity of an optical instrument to increase the size of an object than its original size.
- Objects that cannot be seen by naked eye can be seen by increasing magnification using the technique of **Microscopy.**

- **Relation:** Resolution can be increased by increasing magnification

- **Microscopy:** Range is between mm and nm
- Compound Microscope has ocular lens + objective lens
- Magnification power (mp) of a microscope =

mp of ocular lens x mp of objective lens



Plenary:

1. How is chromatography different from electrophoresis?

2. Differentiate between resolution and magnification.

3. What will be the magnification power of a microscope that has ocular lens of 80X and objective lens of 100X ?

ALLAH HAFIZ