The Microscope

Lec 1 lab biology

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Important properties of Microscopes

1. **Magnification**- the power of the microscope to enlarge the image of an object

2. **Resolution**- the power of the microscope to show detail clearly

Parts of microscope

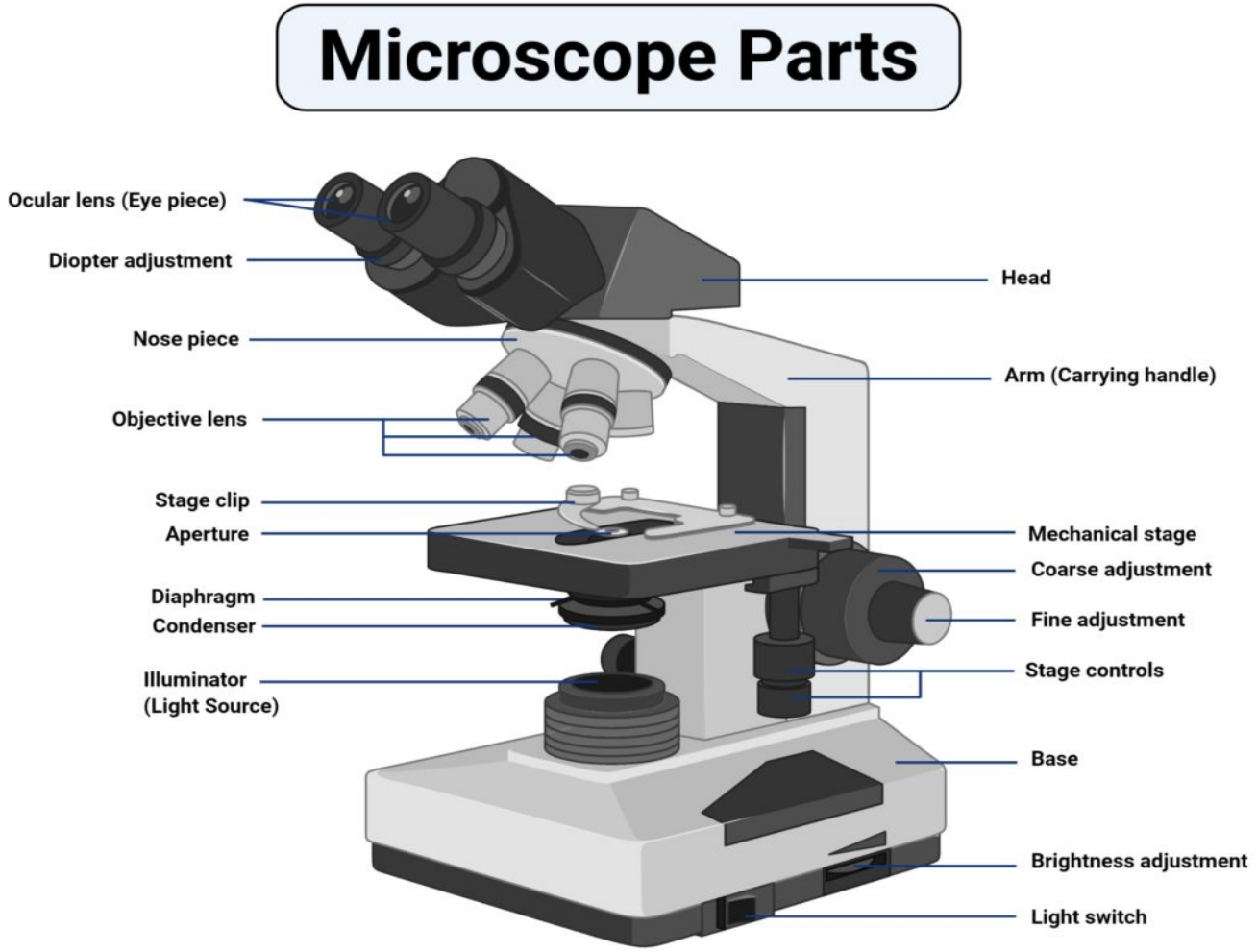

Figure: Parts of a microscope, Image Copyright © Sagar Aryal, www.microbenotes.com

Structural parts

- There are three structural parts of the microscope i.e. head, base, and arm.

1. **Head** – This is also known as the body, it carries the optical parts in the upper part of the microscope.
2. **Base** – It acts as microscopes support. It also carriers the microscopic illuminators.
3. **Arms** – This is the part connecting the base and to the head and the eyepiece tube to the base of the microscope. It gives support to the head of the microscope and it also used when carrying the microscope.

Compound Light Microscope Parts and Function

1. **Ocular (eyepiece)-** part you look through

   -contains lenses that contribute to total magnification

   -power of 10x (magnifies 10 times)

Microscope Parts and Function

2. Body tube- hollow tube that keeps the lenses of the ocular and objectives at a set distance

3. Nosepiece- holds objectives

Microscope Parts and Function

4. Objectives- contain lenses that contribute to total magnification

Magnification formula- calculate total magnification

Total mag. = ocular power X objective power

Total Magnification

Ocular	Objective
10x	red 4 = 40x
10x	yellow 10 = 100x
10x	white 100 = 1000x
10x	blue 40 = 400x

*microscopes we use are **parfocal**- can switch b/t lenses without much adjusting

**only use lens paper to clean objectives

Microscope Parts and Function

5. Arm- supports body tube

6. Base- supports entire microscope

(when carrying, keep hand back on base because lamp will be hot!)

7. Stage- tray-like structure that supports specimen/slide over stage opening

Microscope Parts and Function

8. Stage Clips- keep specimen/slide tight against stage

9. Stage Opening- allows light to pass through/around specimen

10. Diaphragm- controls amount of light that reaches your eye

Microscope Parts and Function

11. Light source- provides light to create the image that you see

12. Coarse adjustment- larger knob, that moves 1 of 3 structures (body tube, stage, or nosepiece) and allows for rough focus

Microscope Parts and Function

13. Fine Adjustment- smaller knob, moves the objectives slightly and allows for fine focusing

Microscope Classifications

- Based on how image is created

1. **Light Microscope**

   -uses light to create specimen image

   -lenses are glass or plastic

   -magnification and resolution are good (2,000x)

Benefits of Light Microscopes

- Smaller portable
- Cost effective
- Easy specimen prep (live specimens can be used)
- Training simple/ user friendly
- Can see microscopic items

2 Types of Light Microscope

1. Simple- Has one lens

2. Compound- Has 2 or more lenses

Thank you for your listening