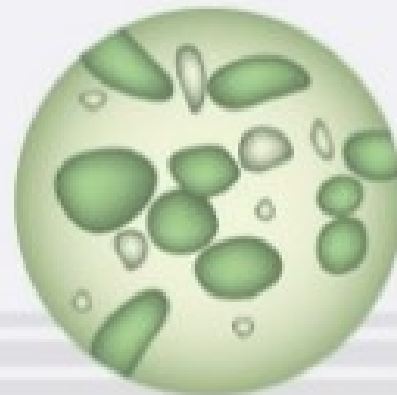


# Microscope



# Light Microscope

SIMPLE

Uses single lens

COMPOUND

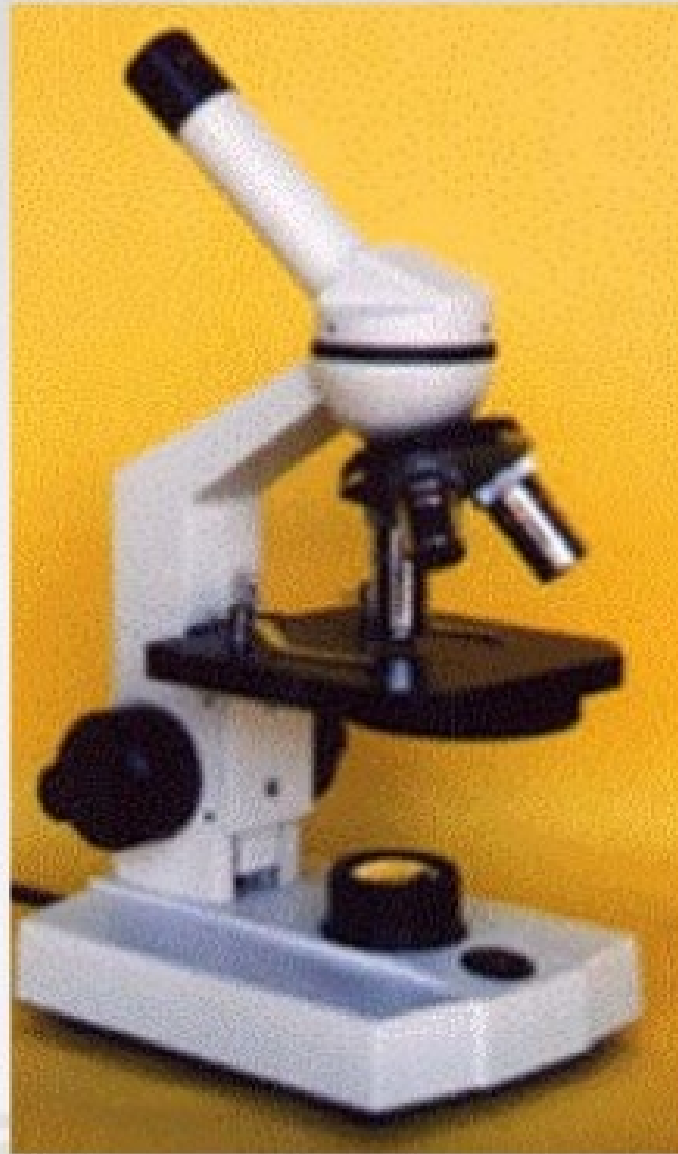
Uses set lenses or a lens system



# Simple Light Microscope



# Compound Microscope



# Compound Microscope

Mechanical Parts

Magnifying Parts

Illuminating Parts

Adjustments  
and Support

Enlarge the  
specimen

Provide the  
light

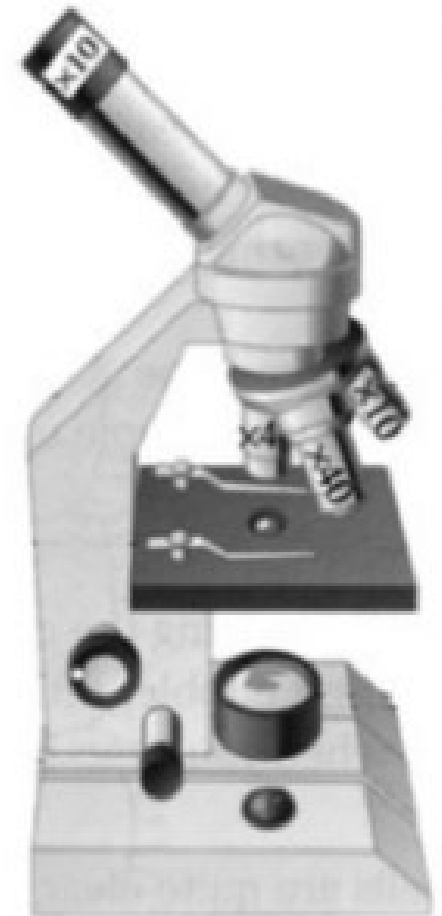


# Total Magnification

Magnification = Objective lens X Eyepiece lens

e.g. What is the total magnification if the objective lens is twenty times (X20) and the eyepiece lens five times (X5)?

**Magnification = 20 X 5 = X100**

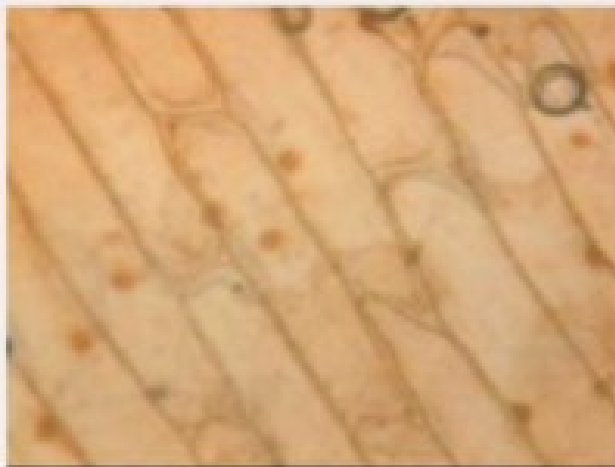


**As magnification increases, detail increases but**

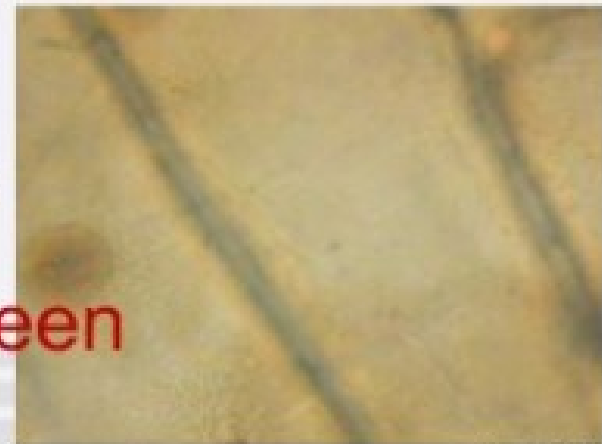
**Onion cell**



**Onion cell 100x**



**Onion cell 400x**

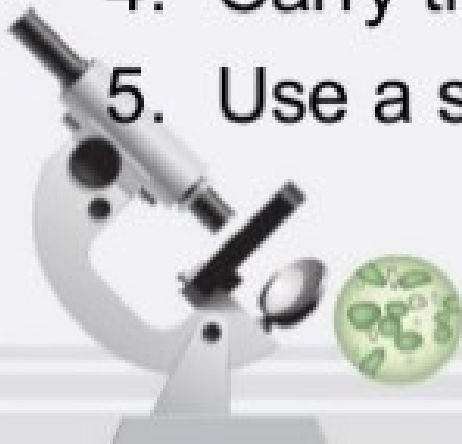


**less of the cell is seen**



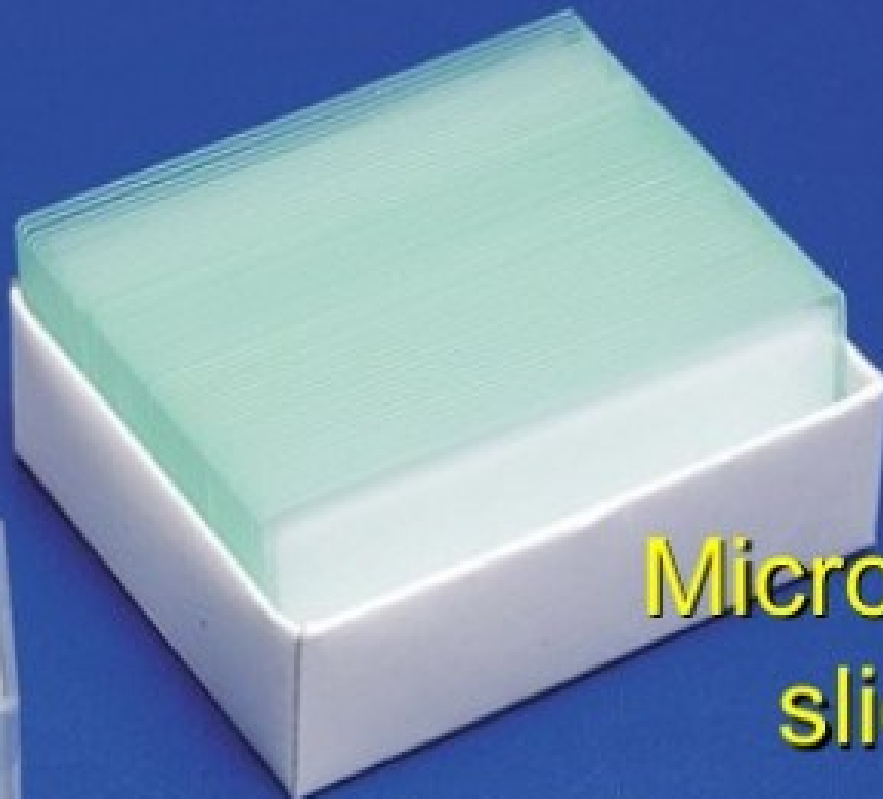
# Caring for the Microscope

1. Do not let any liquids to come in contact with the microscope.
2. Always store the microscope inside a box after use.
3. Return the objective lens onto low power after use.
4. Carry the microscope by the arm.
5. Use a soft clean tissue to wipe the lenses





**Coverslip  
s**



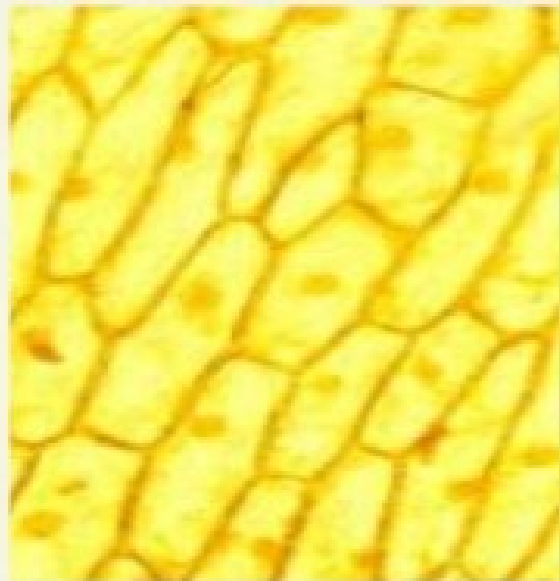
**Microscope  
slides**



- other cell structures which are not so obvious can often be shown up more clearly by the addition of dyes called **STAINS**

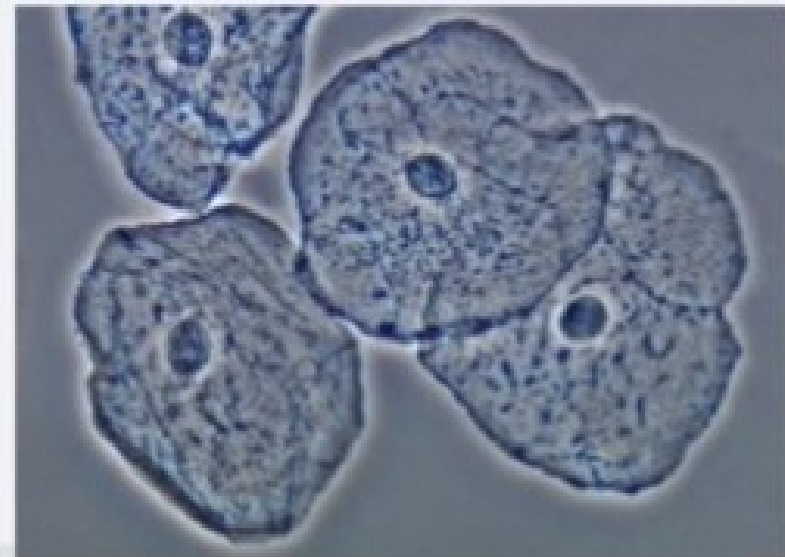
### Iodine Solution

Used to stain plant cells

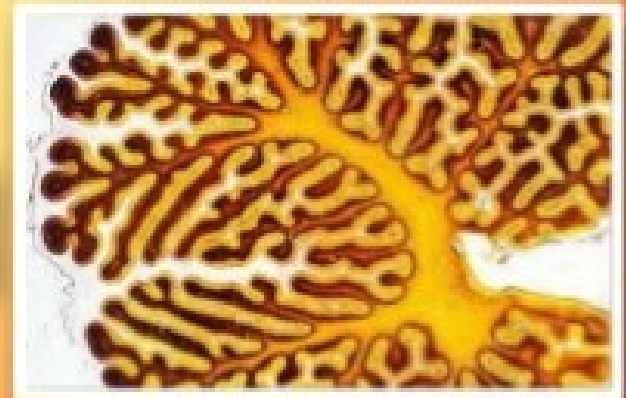
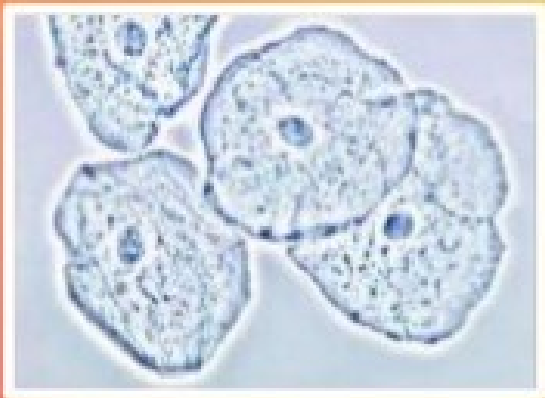
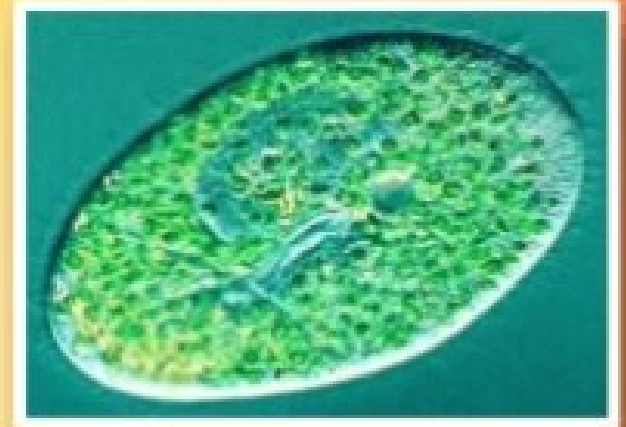


### Methylene Blue

Used to stain animal cells



# MICROSCOPE PARTS



# PARTS OF THE COMPOUND LIGHT MICROSCOPE

*Do you know some of these parts?*

*Label as many parts as you can using the terms provided.*

revolving nosepiece

arm

diaphragm

ocular lens / eyepiece

condenser

objective lenses

stage clips

body tube

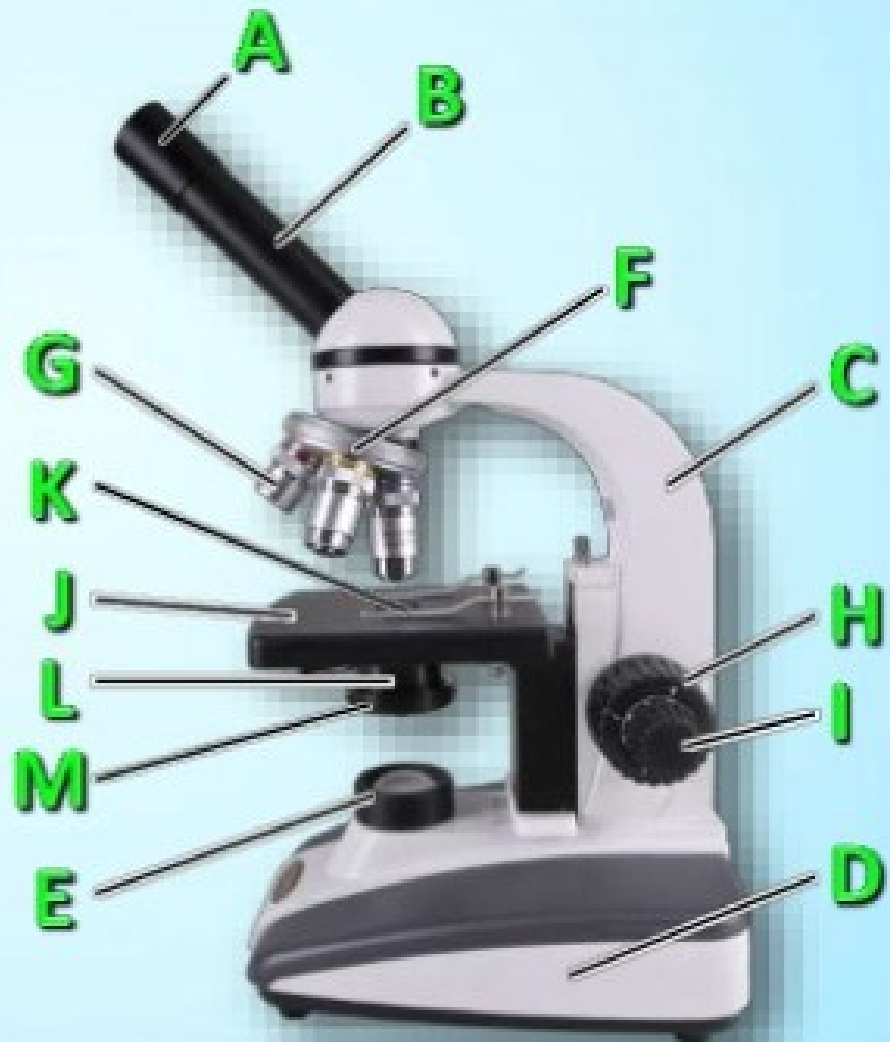
base

light source / illuminator

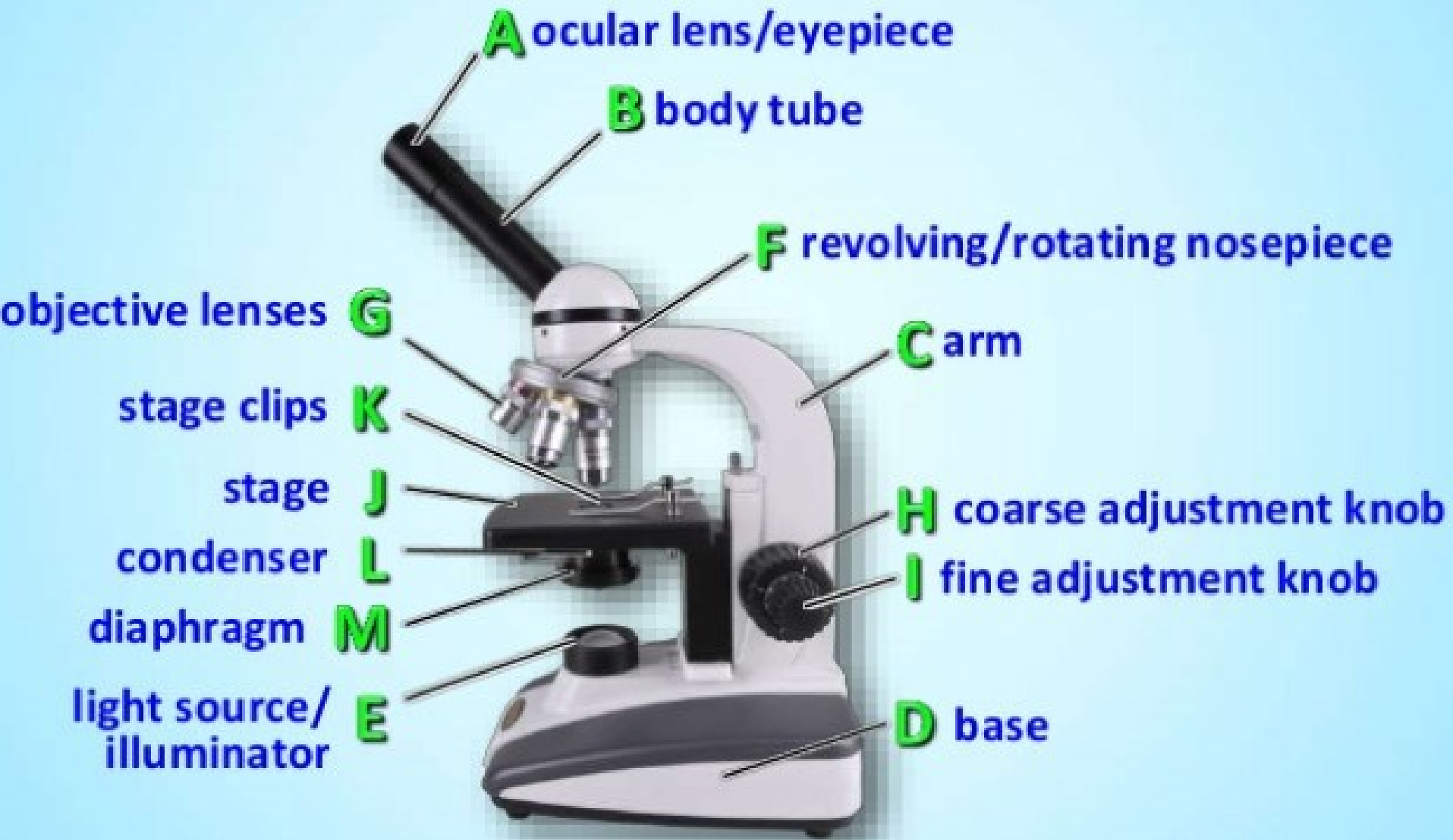
coarse adjustment knob

stage

fine adjustment knob



# PARTS OF THE COMPOUND LIGHT MICROSCOPE



# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Ocular Lens / Eyepiece



- Contains a lens to **magnify** the image of the specimen.
- The usual magnification is **10** X.



# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Ocular Lens / Eyepiece



- Contains a lens to **magnify** the image of the specimen.
- The usual magnification is **10** X.
- Some microscopes have **two** ocular lenses.

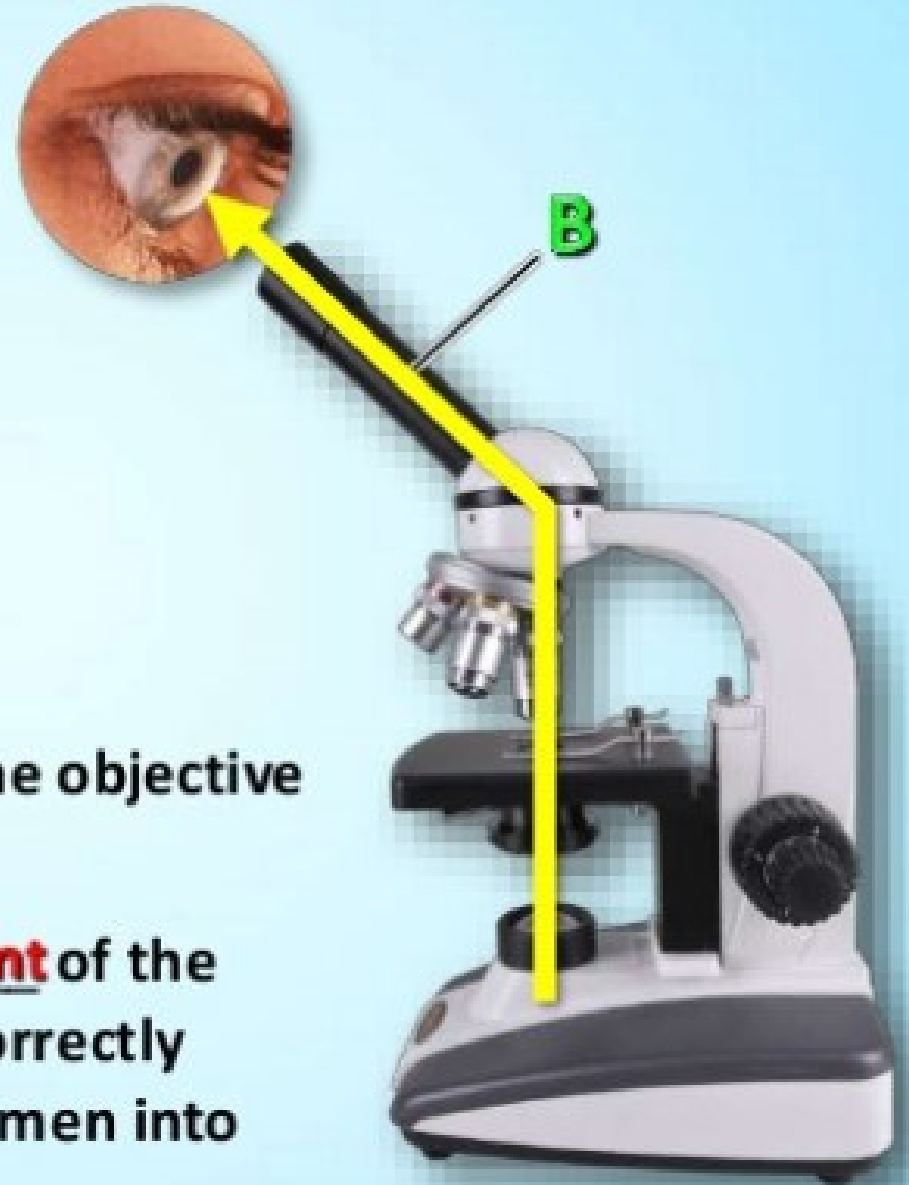


# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Body Tube



- It **connects** the eyepiece to the objective lenses.
- It ensures the correct **alignment** of the microscope components to correctly **direct** the light from the specimen into the viewer's eye.





# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Arm



- It connects the body tube to the base.
- One hand should be around the arm when carrying the microscope (the other should be under the base).



# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Arm



- It **connects** the body tube to the base.
- One **hand** should be around the arm when **carrying** the microscope (the other should be under the **base**).



# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Base



- It supports the weight of the microscope.
- It contains the electronics and light source.
- One hand should be under the base while carrying the microscope (the other hand should be holding the arm).



# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Base

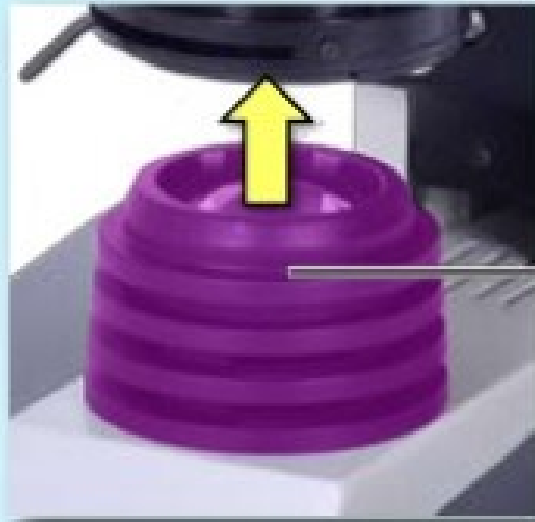


- It supports the weight of the microscope.
- It contains the electronics and light source.
- One hand should be under the base while carrying the microscope (the other hand should be holding the arm).

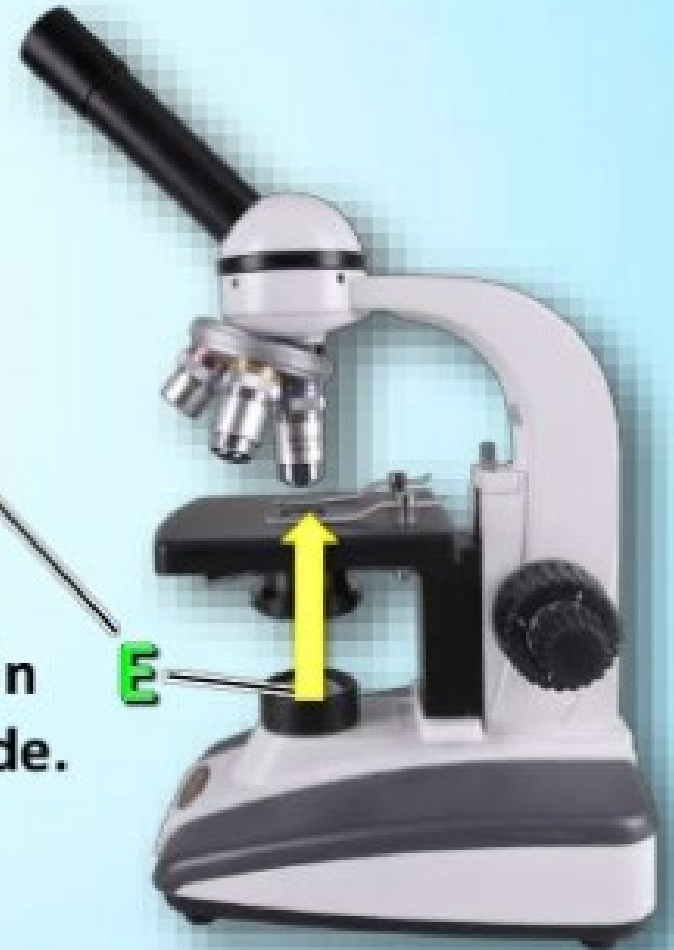


# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Light Source / Illuminator



- It sends light upwards through the condenser lens and through the hole in the stage onto the specimen on the slide.

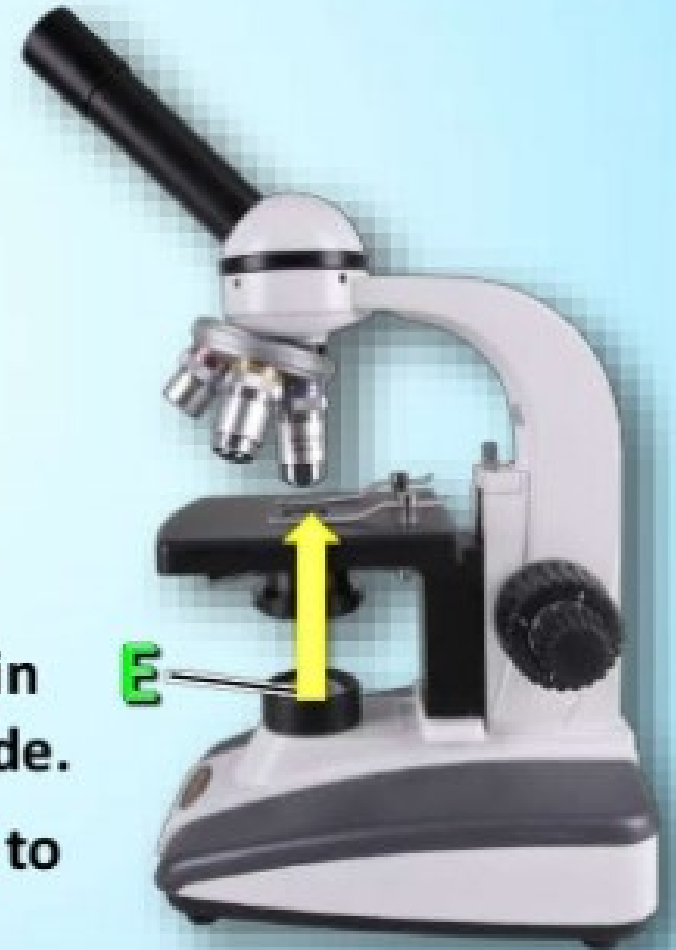


# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Light Source / Illuminator



- It sends light upwards through the condenser lens and through the hole in the stage onto the specimen on the slide.
- Older microscopes used to use mirrors to reflect the ambient light upwards.



# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Revolving/Rotating Nose Piece



- The **objective lenses** are attached to it.
- **Rotating** the nose piece allows you to **switch** between the different lenses.

# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Objective Lenses



Low (scanning) **4 X**

Medium **10 X**

High **40 X**

**G**



- These lenses further magnify the image of the specimen.
- The magnifications are usually 4 X , 10 X and 40 X .
- There are usually 3 lenses



# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Objective Lenses



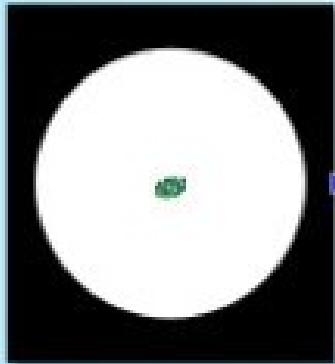
- These lenses further **magnify** the image of the specimen.
- The magnifications are usually **4 X** , **10 X** and **40 X** .
- There are usually **3** lenses but some have **4** lenses.



# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Objective Lenses

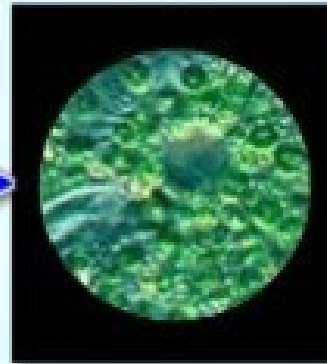
Low



Medium



High



- As the power increases, the magnification becomes **larger** , but the field of view (visible area) becomes **smaller** .

# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Coarse Adjustment Knob



H

- The first knob you should use, and always under low power. Never use it in high power.



# PARTS OF THE COMPOUND LIGHT MICROSCOPE

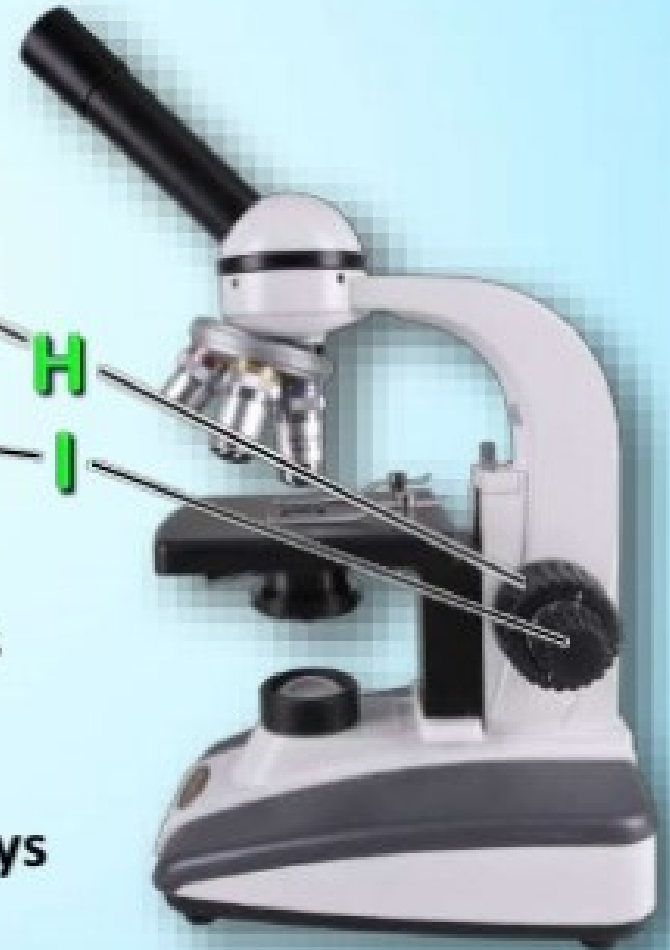
## Fine Adjustment Knob



- The **first** knob you should use, and always under **low** power. Never use it in **high** power.
- The **second** knob you should use under **higher** power for **exact** focusing.
- Both knobs move the **stage** up and down to help put the specimen in **focus**.

# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Fine Adjustment Knob



- Some microscopes have the two knobs located **one on top of the other**
- The smaller one on the bottom is always the **fine** adjustment knob.

# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Stage



- The stage is where you place the slide which contains the specimen.
- It contains a hole that allows light to pass through the stage and onto the specimen.



# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Stage Clips



- The stage is where you place the slide which contains the specimen.
- It contains a hole that allows light to pass through the stage and onto the specimen.
- The stage clips secure the slide on the stage.

# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Condenser Lens



- The lens under the stage that **focuses light** from the illuminator through to the **hole** in the stage.





# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Condenser Lens



- The lens under the stage that focuses light from the illuminator through to the hole in the stage.



# PARTS OF THE COMPOUND LIGHT MICROSCOPE

## Diaphragm



- The lens under the stage that **focuses light** from the illuminator through to the **hole** in the stage.
- It contains a dial that rotates to **adjust** the **amount of light** that reaches the specimen.



*The End!*





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