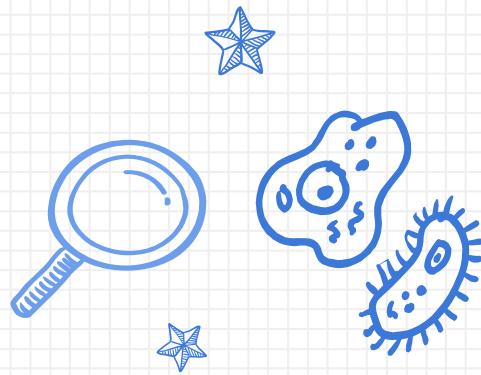


Introduction to Microscopes

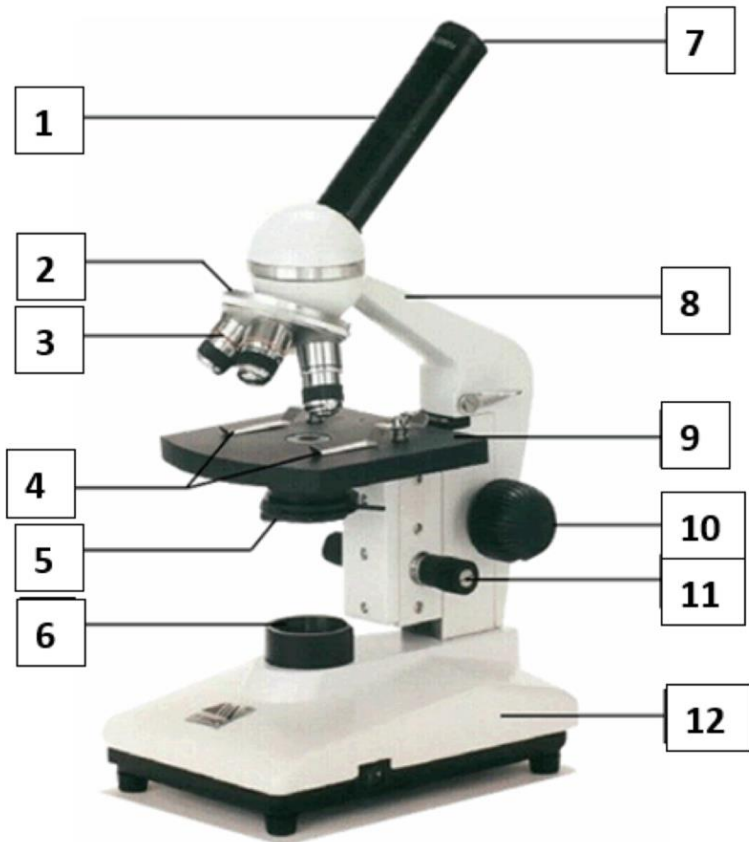




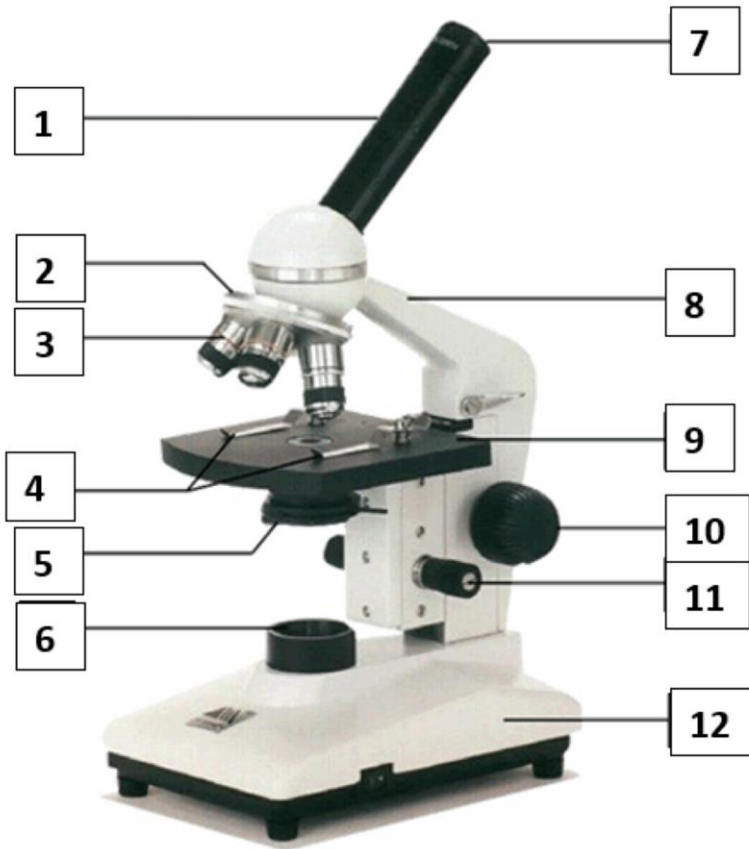
Compound Light Microscopes

What are they?

Instrument that allows you to view small objects. This type of microscope has more than one lens with its own light source that helps magnify objects unseen by the unaided eye.

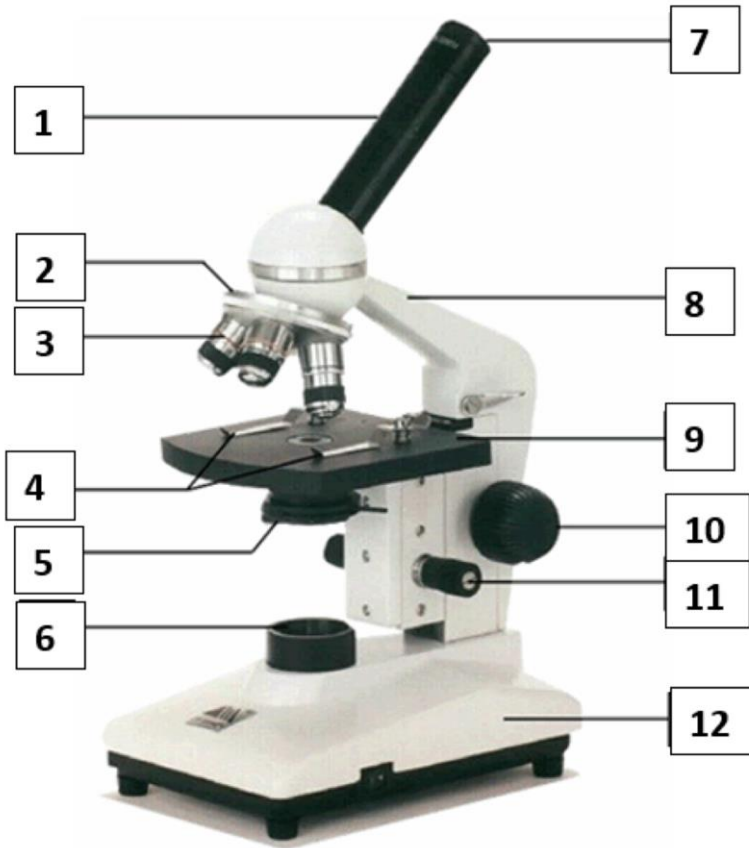


Label the Parts of the Microscope



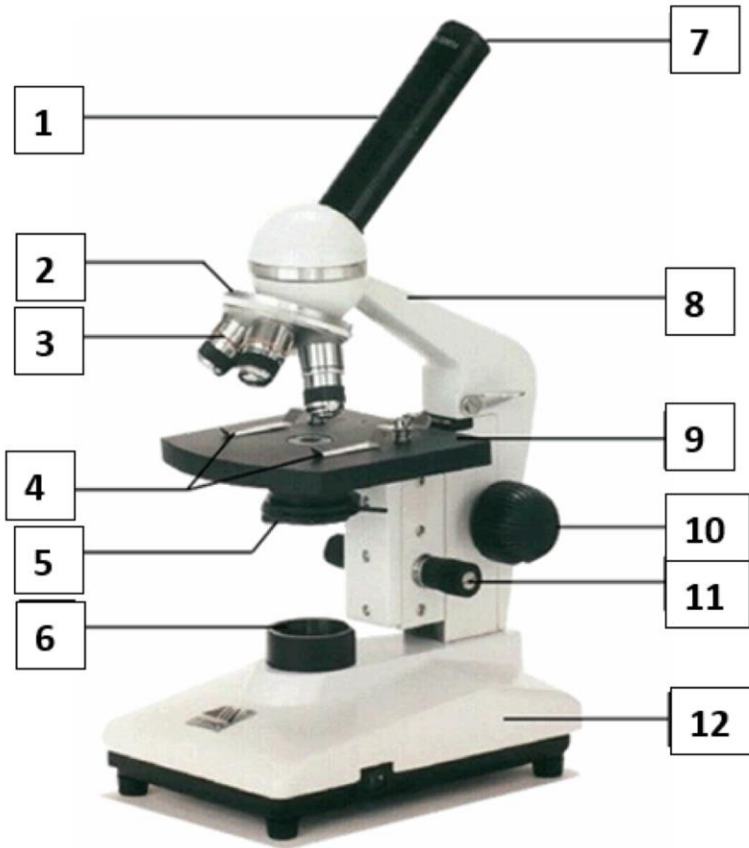
7 - Eyepiece

What you look through -
usually has 10x
magnification



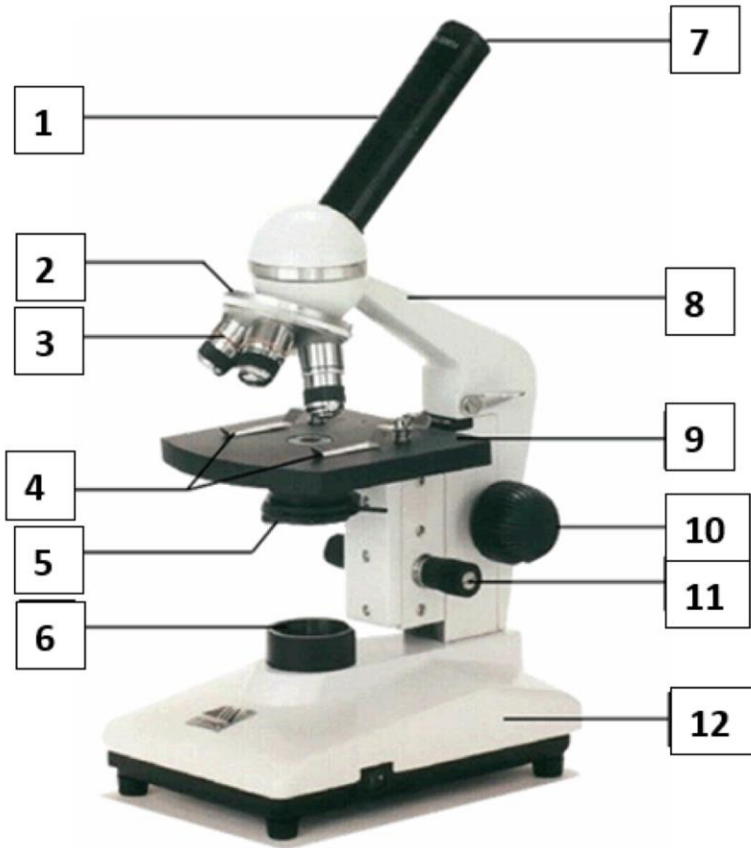
1 - Body Tube

Holds eyepiece in place



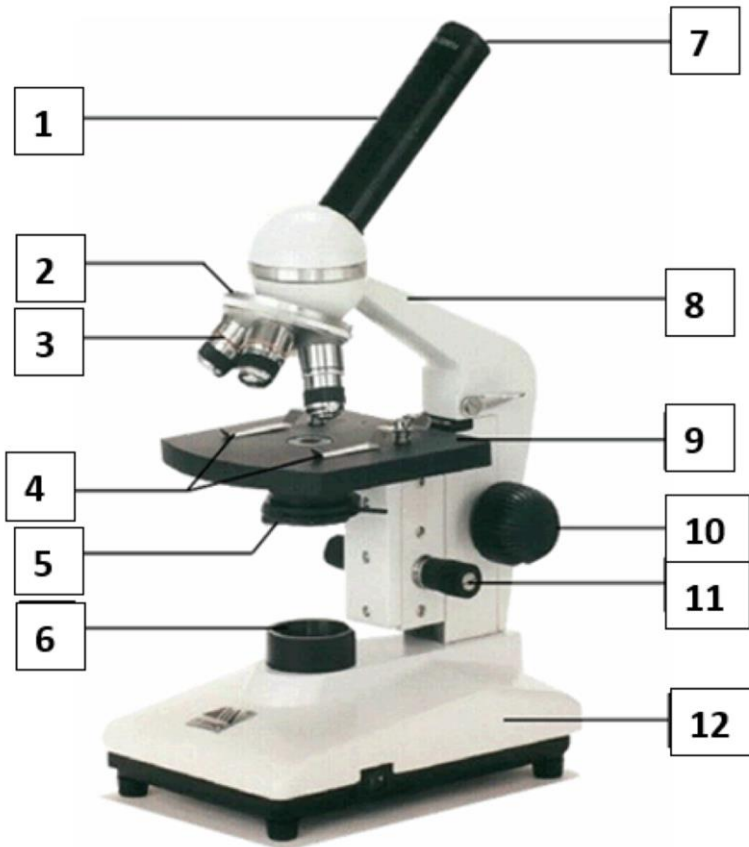
8 - Arm

Support the body tube; used to carry microscope



12 - Base

Supports the microscope; used to carry the microscope



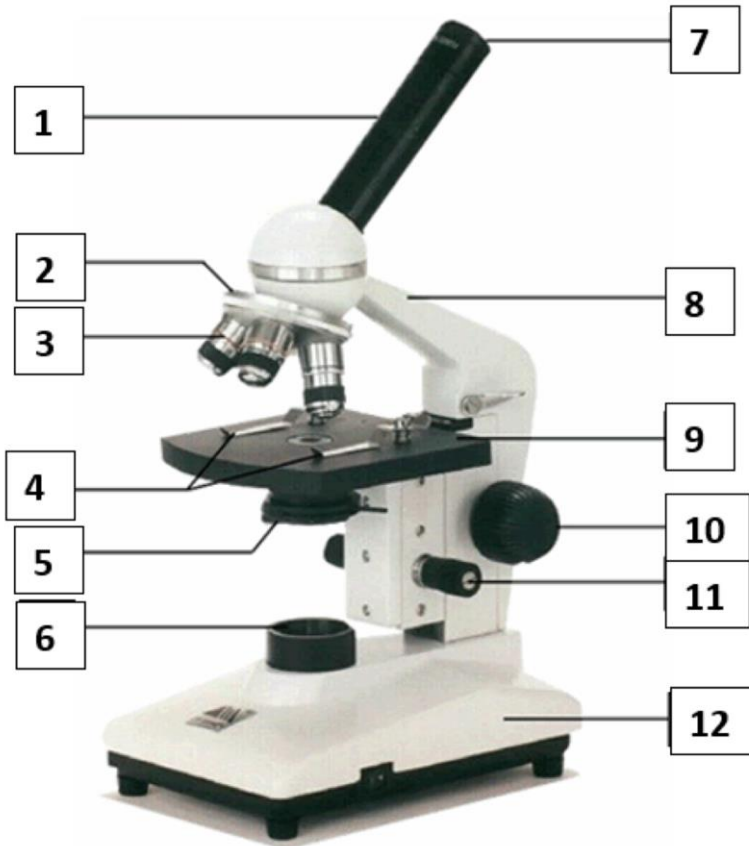
3 - Objective Lenses

Primary magnification source (ranges from 4x - 40x magnification)

LOW: 4x

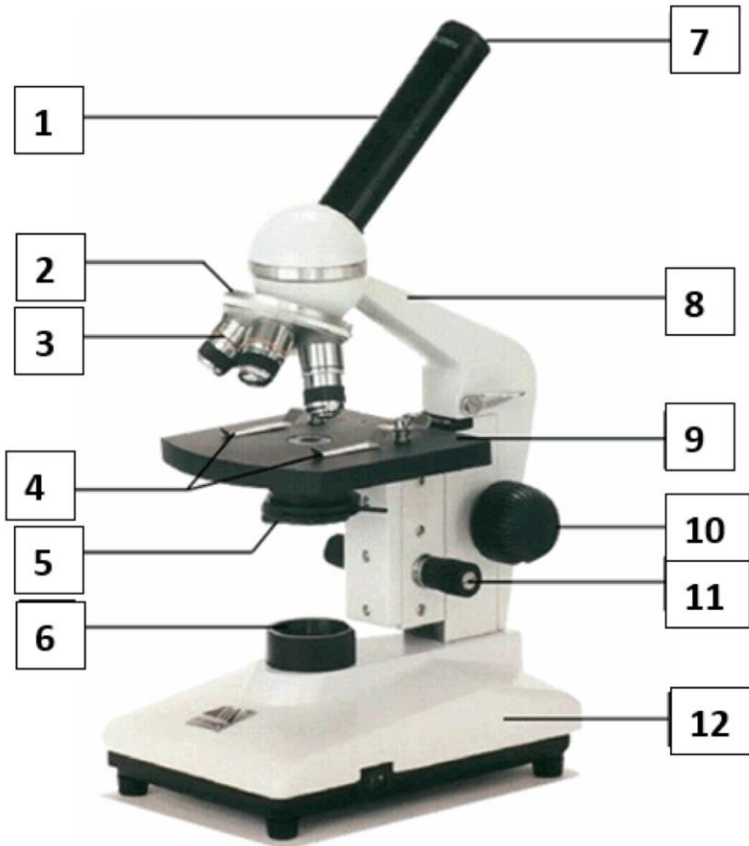
MEDIUM: 10x

HIGH: 40x



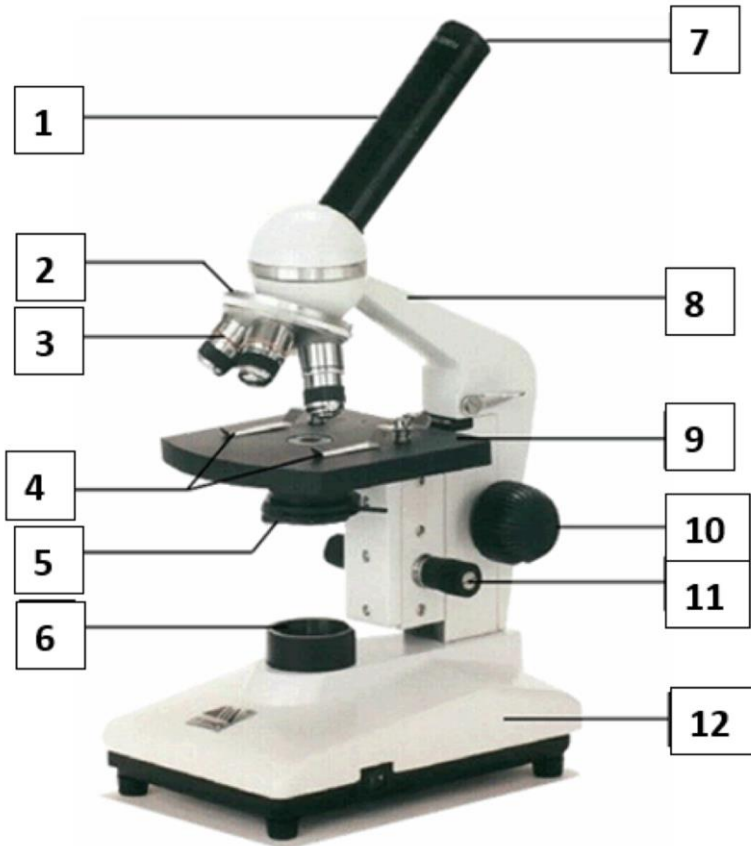
2 - Turret

Holds objective lenses & turns them into place



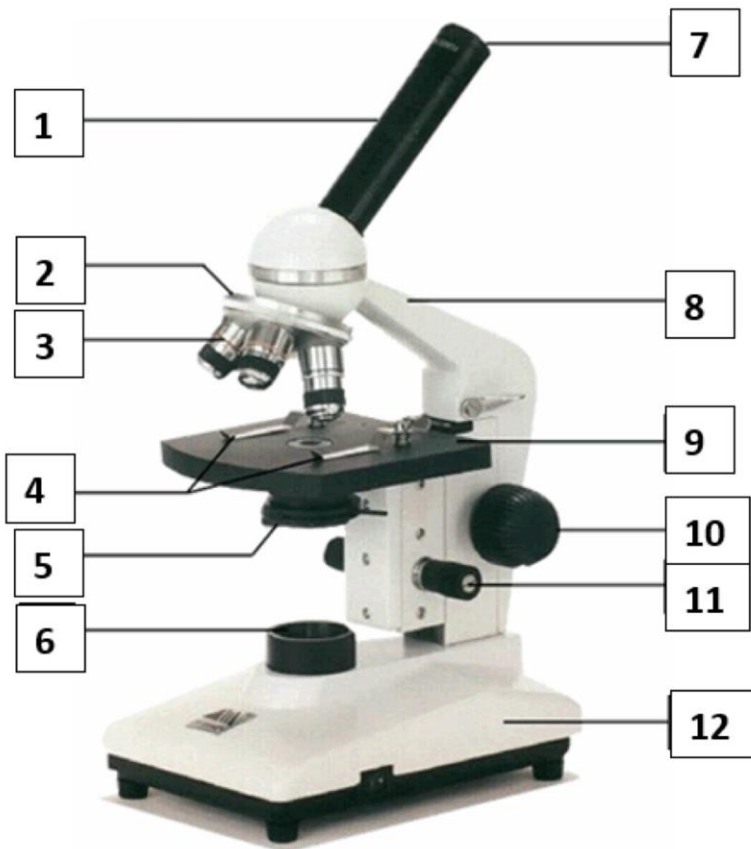
9 - Stage

Where slide is placed;
can be moved up/down
using adjustment knobs



4 - Stage Clips

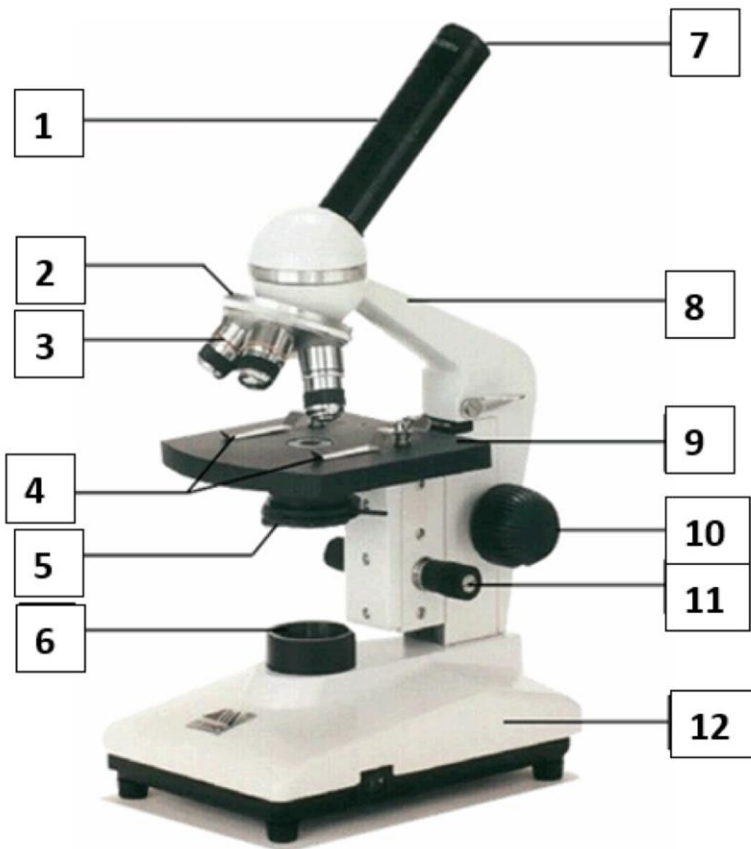
Holds the
microscope slide in
place



10 - Coarse
Adjustment Knob

Focus the
microscope

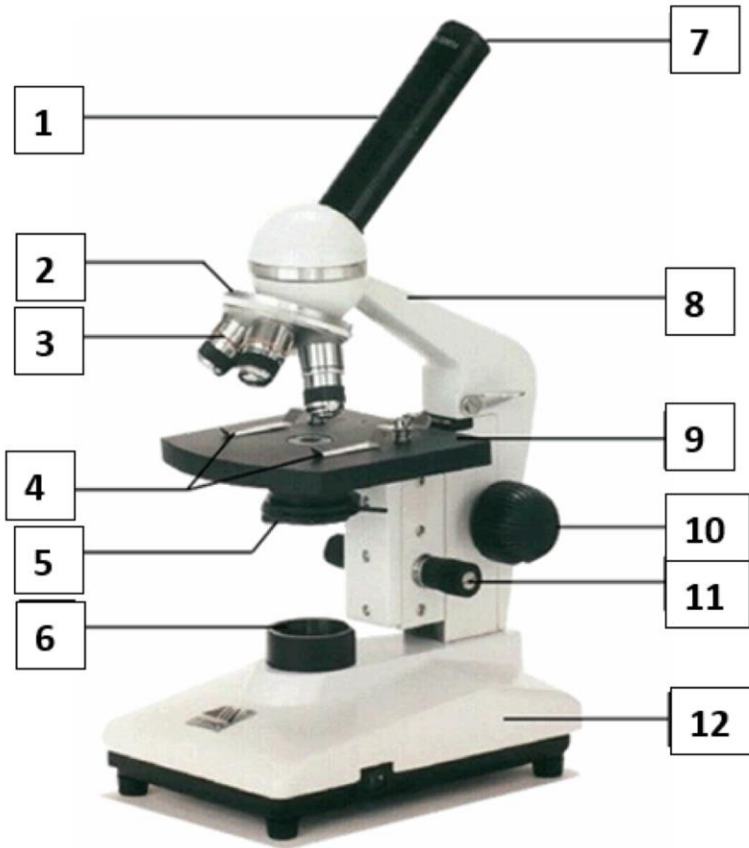
Only to be used with
LOW and MEDIUM
power objective
lenses



11 - Fine Adjustment Knob

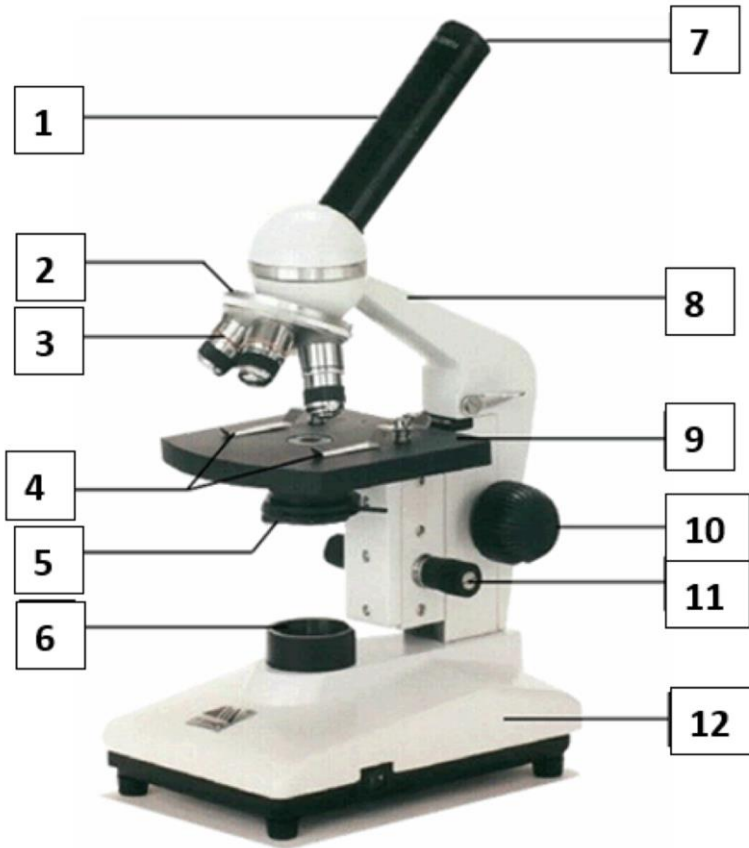
Focus the microscope

Used with HIGH-power objective lens



6 - Light

Illuminates the slide

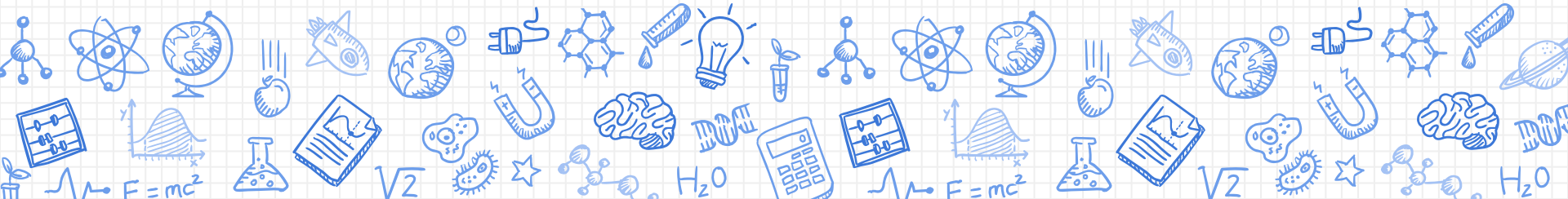


5 - Diaphragm

Controls amount of light

Rules

what to follow when using microscopes



Videos for Microscope Handling

Basic How to Use

https://www.youtube.com/watch?v=zzamomqlwxU&ab_channel=Dr.JoycePatrick

Troubleshooting

https://www.youtube.com/watch?v=SUo2fHZaZCU&ab_channel=FresnoState



How to Handle Microscopes

- X** Use 2 hands to carry the microscope - one at the **arm** & the other supporting the **base**
- X** Care for the electrical cord - beware of tripping hazards
- X** Do not touch the lens with your fingers - use proper lens tissue to clean the surfaces



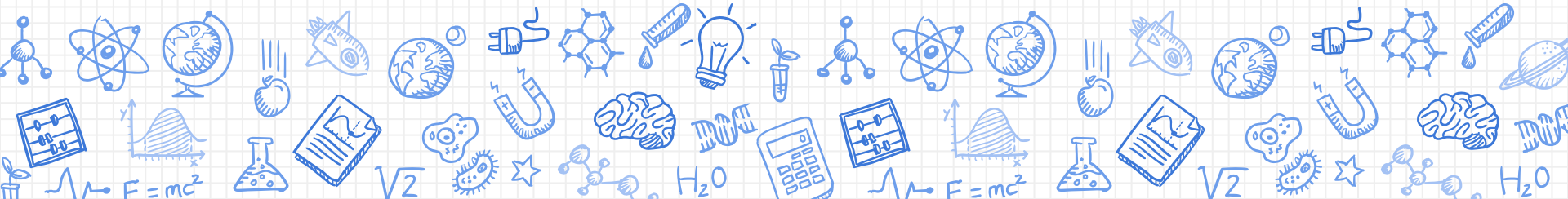


How to Handle Microscopes

- X** Do not adjust any knobs until you are ready to use the microscope
- X** Always focus using the **coarse** adjustment knob first - with the **low-power** objective lens. Then focus on **medium-power**.
- X** Only use the **fine** adjustment knob with the **high-power** objective lens
- X** Always be gentle when handling microscopes & slides

Wet Mounts

how to prepare a slide



Preparing Slides

1. Clean the slide & cover slip
2. Place the object in the centre of the slide - add 2 drops of water & carefully lower cover slip on top
 - a. Lower the cover slip at an angle to prevent bubbles
3. Remove excess water with paper towel - touch to side of cover slip

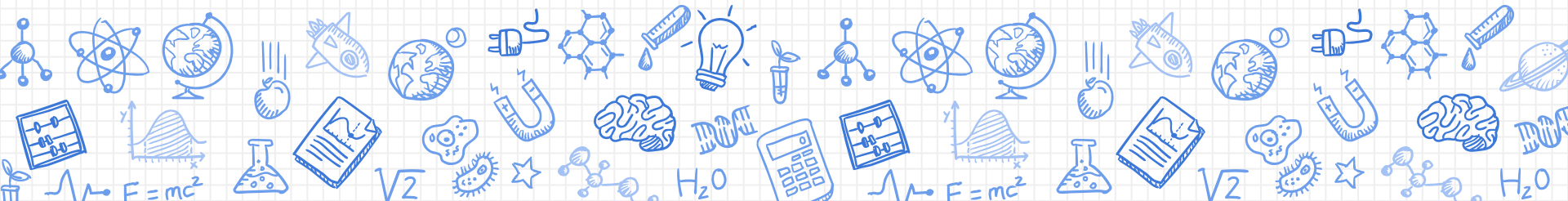


Raise the stage as high as it goes
with the coarse adjustment knob

Preparing a Wet Mount

Magnification

how much is the image amplified?



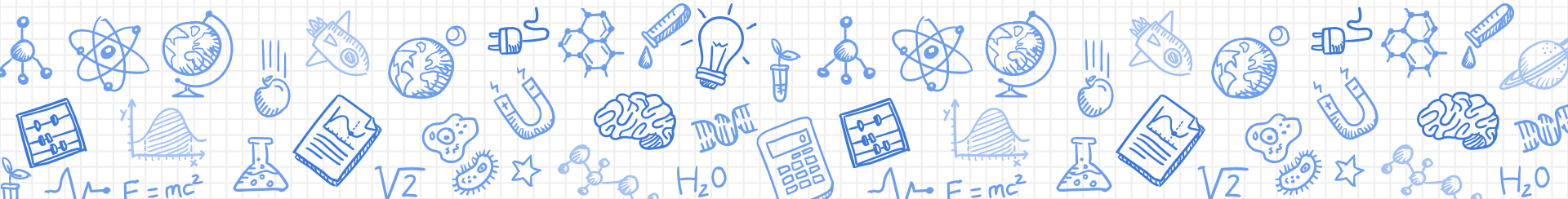
Total Magnification = Eyepiece Magnification x Objective Lens Magnification

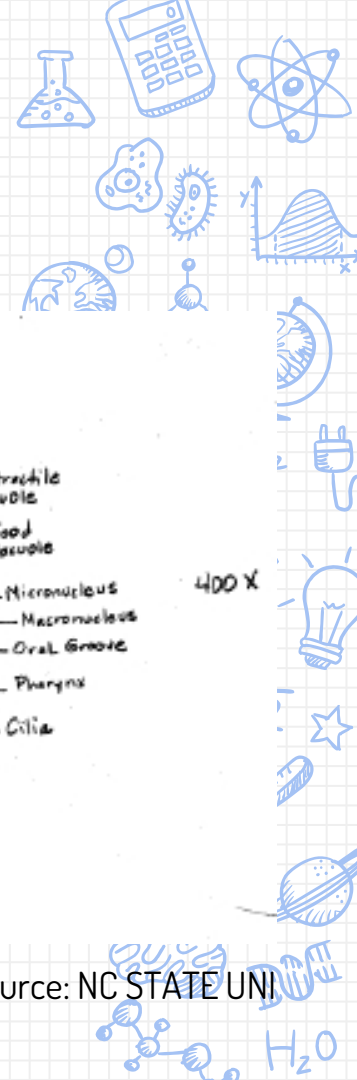


OBJECTIVE LENS	MAGNIFICATION	TOTAL MAGNIFICATION
Low-Power	4 x	10 x 4 = 40 x
Medium-Power	10 x	10 x 10 = 100 x
High-Power	40 x	10 x 40 = 400 x

Biological Drawings

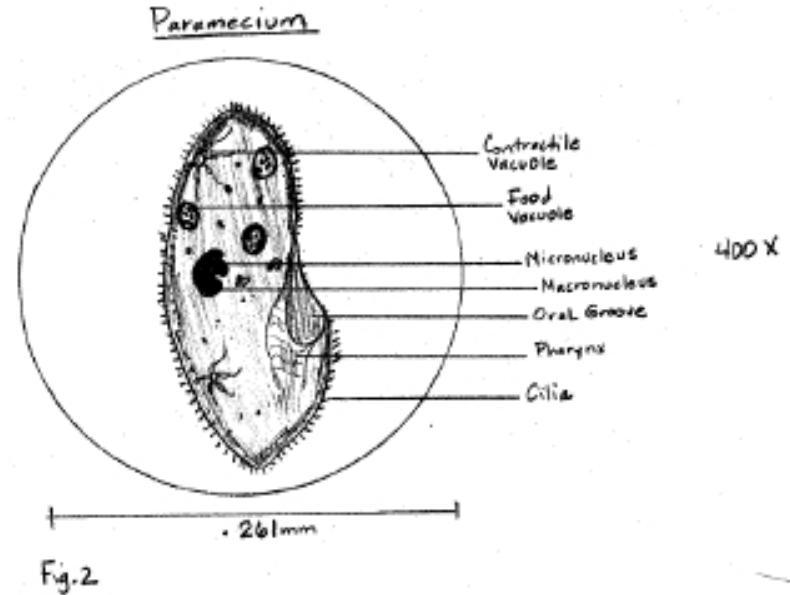
sketching out what you see



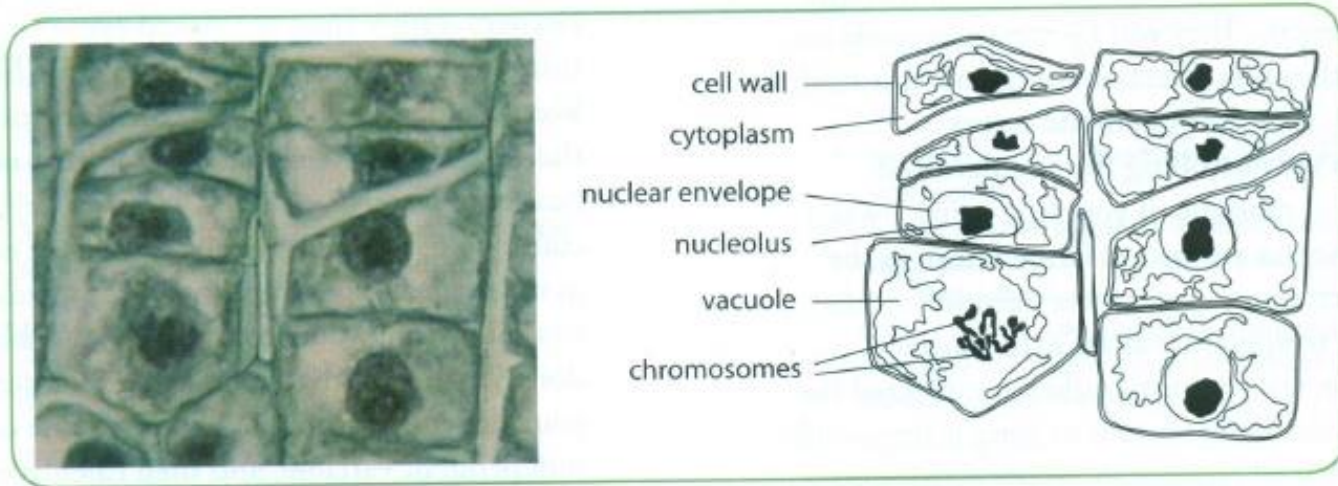


Important Features of Sketches

- X Use a pencil
- X Use stippling (point-like pencil marks) to show darker areas
- X Title
- X Labels on the right with extending lines
- X Magnification used to view



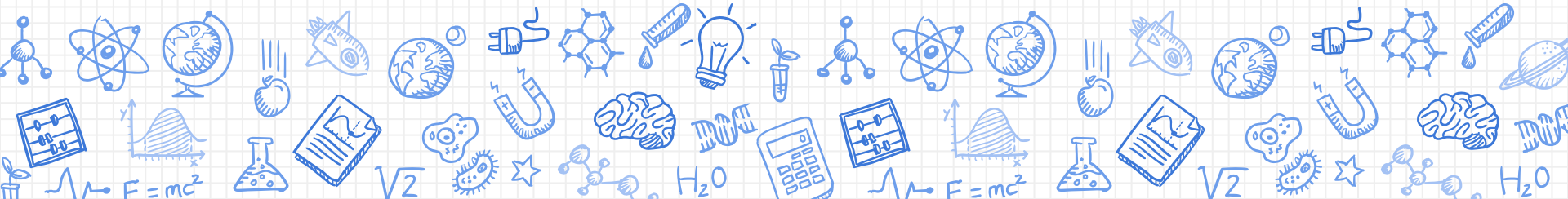
Source: NC STATE UNI

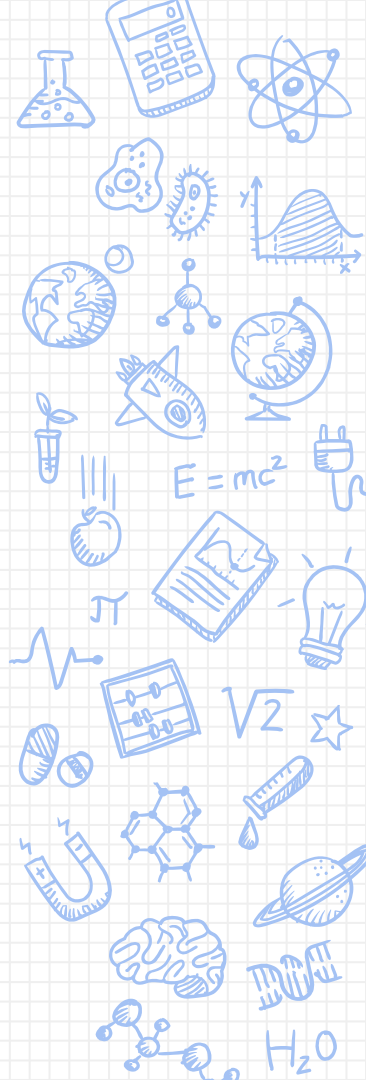


Source: BIOLOGY 4 A LEVEL

Clean Up

how to properly store microscopes





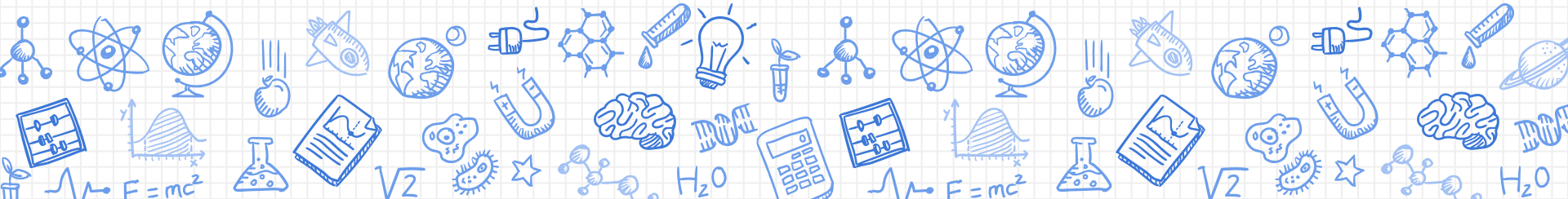
Follow the acronym:

- X C - cord wrapped
- X L - light off
- X O - objective lens to LOW
- X S - stage lowered
- X E - eyepiece rotated

Cover up the microscope when not in use.

How To Demo

viewing a slide





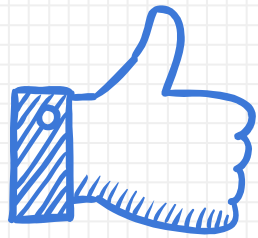
How to Use a Microscope!

1. Set up microscopes - follow the rules!
2. LOW-power objective lens locked into place
3. Look through eyepiece - adjust diaphragm until view is the brightest it can be
4. Secure the slide in place using the stage clips - object is in centre of the stage opening
5. Look through eyepiece - adjust coarse knob slowly until object in focus
 - a. Use fine adjustment knob to sharpen focus

How to Use a Microscope!

6. Once in focus at LOW power, rotate nosepiece to MEDIUM-power lens
 - a. Be sure that the objective lens does not hit the surface of the slide (look from the side)
7. View object under HIGH-power lens (follow same procedure as above)
8. Draw a sketch of what you see- use tips provided!
9. Rotate nosepiece to LOW, return slide to proper container - follow clean up procedure





THANKS!

Any questions?



How to Use a Microscope!

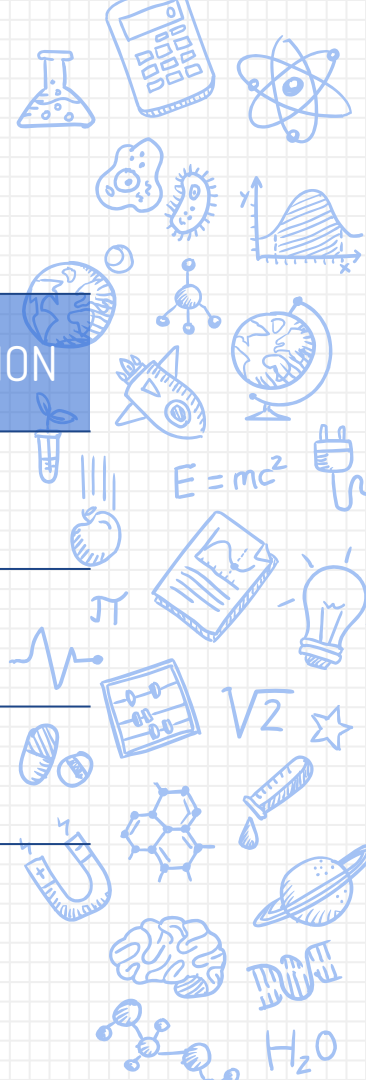
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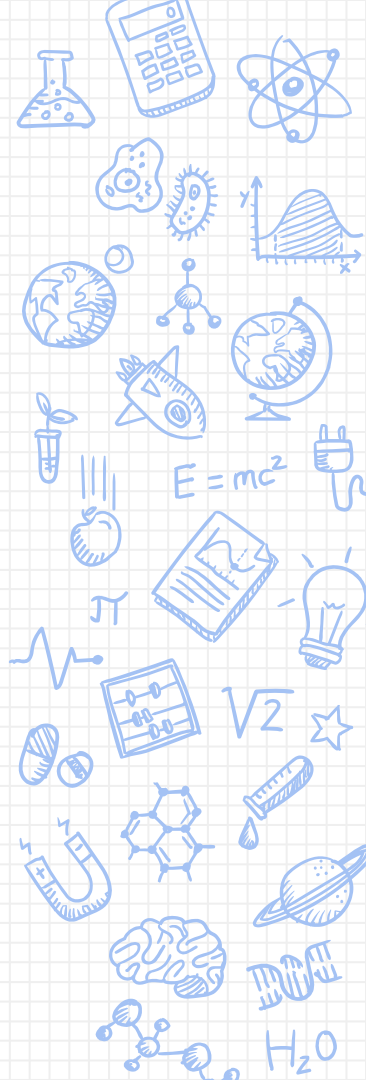
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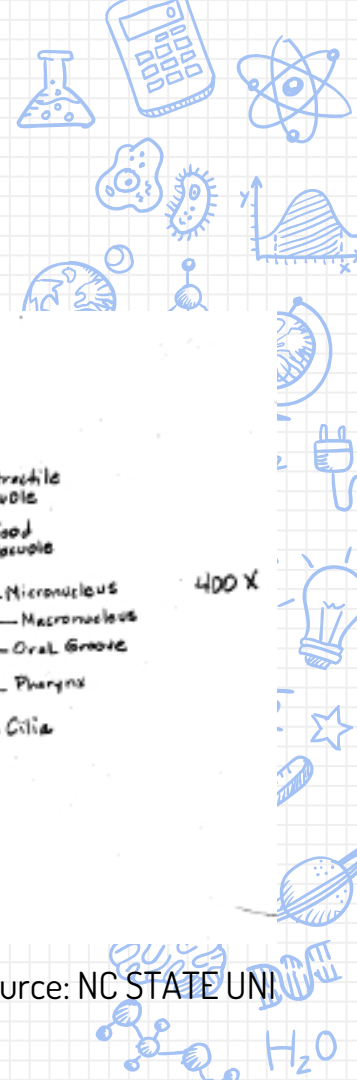
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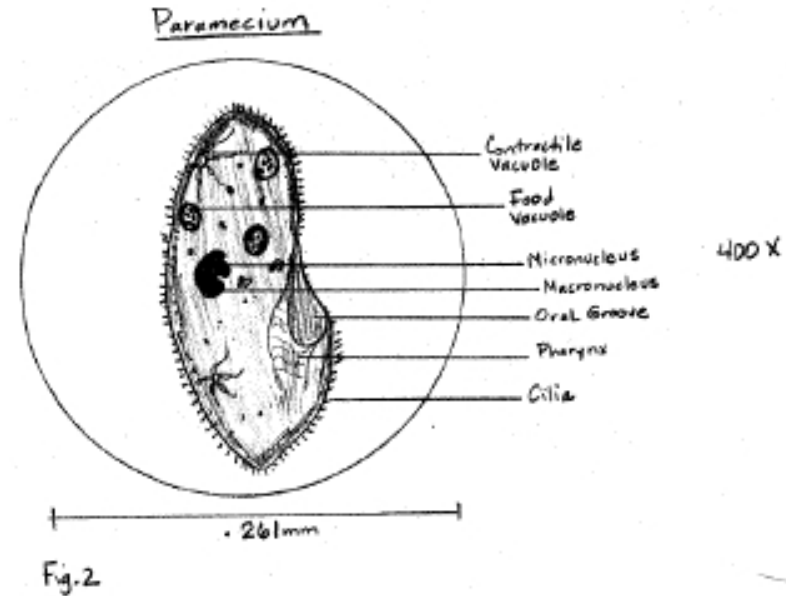
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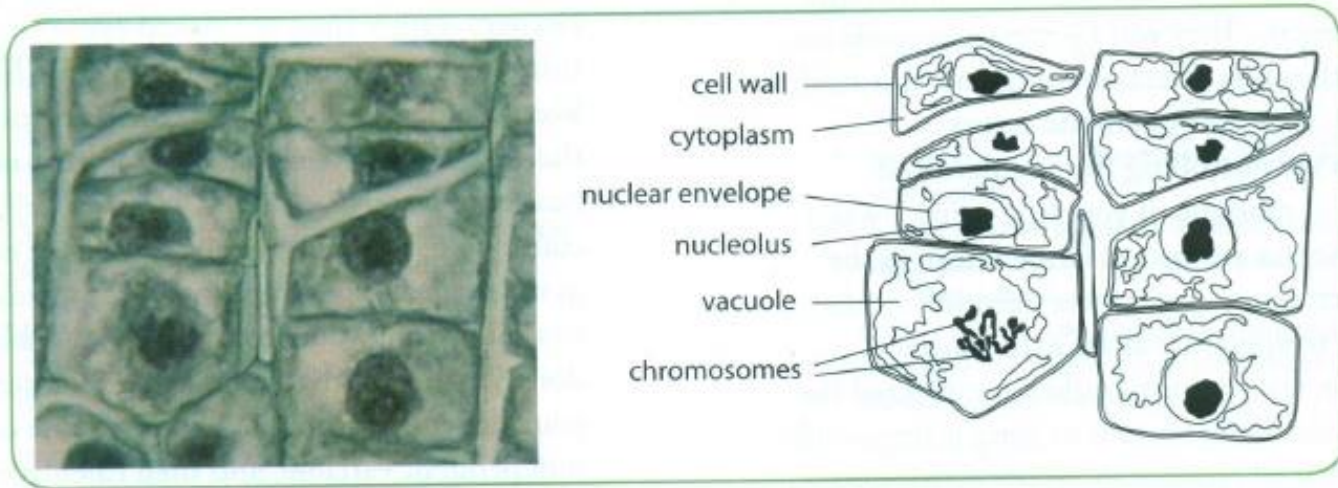


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- X Use a pencil
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Source: NC STATE UNI



Source: BIOLOGY 4 A LEVEL

Microscope Lab/Investigation



PROBLEM	HOW TO SOLVE
You see nothing...it looks black.	Microscope plugged in, light is on.
You can't find anything on the slide.	Solution 1: Check with your naked eye that the object is in the middle of stage opening. If not, adjust its position. Solution 2: Using the low power lens, lower stage all the way & raise it slowly with the coarse adjustment knob.
Image is very faint or too bright.	Adjust diaphragm.
You see lines & specks floating across the slide.	Structures in the fluid of your eyeball - this is normal!
You see a double image.	Objective lens clicked into place.
Your eyes feel tired & you can't sketch the object.	Keep both eyes open.
You can't see the object when you go from low to medium/high power	Start from the beginning at low power. Centre the slide in the field of view before changing to higher magnification lens.