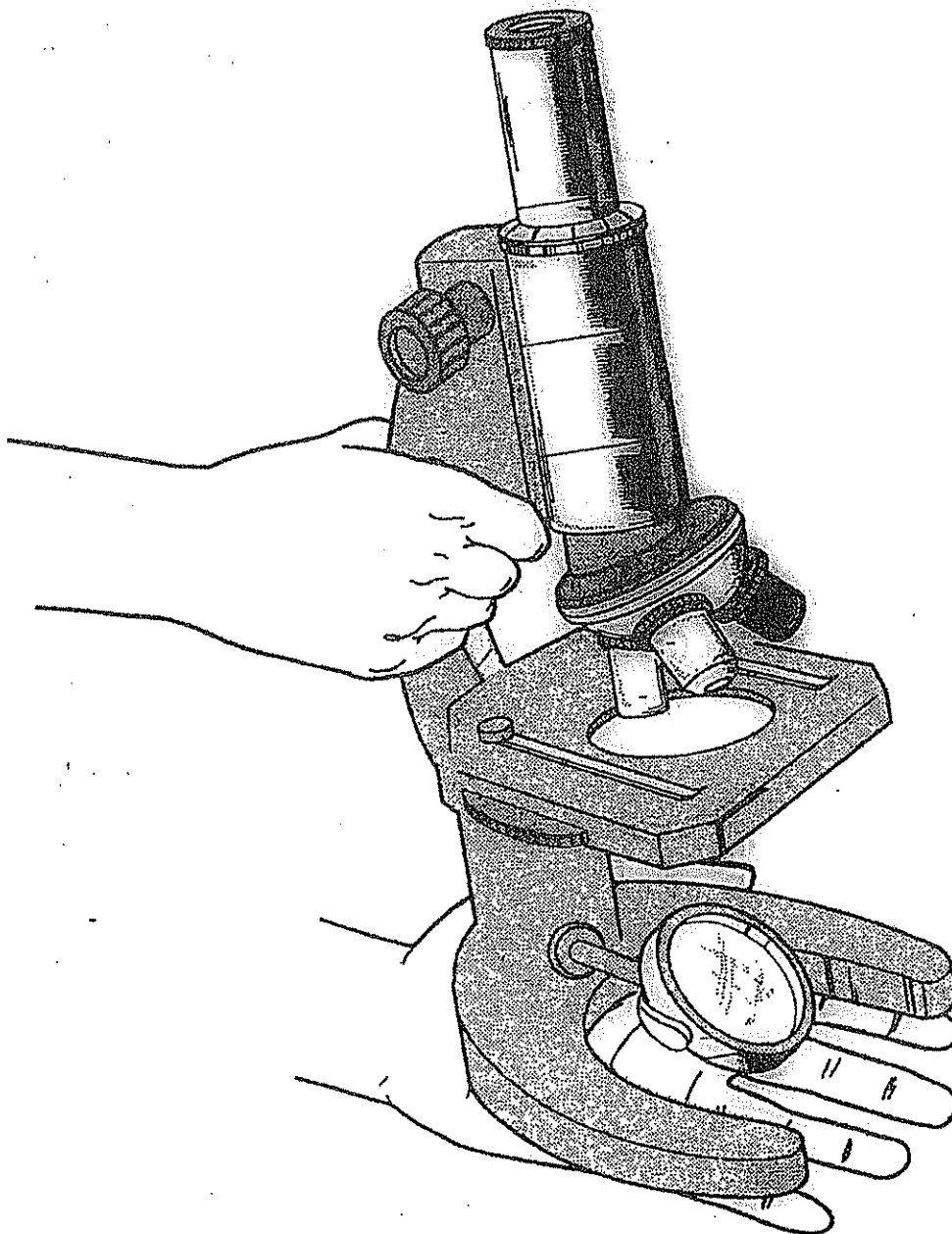


Name \_\_\_\_\_

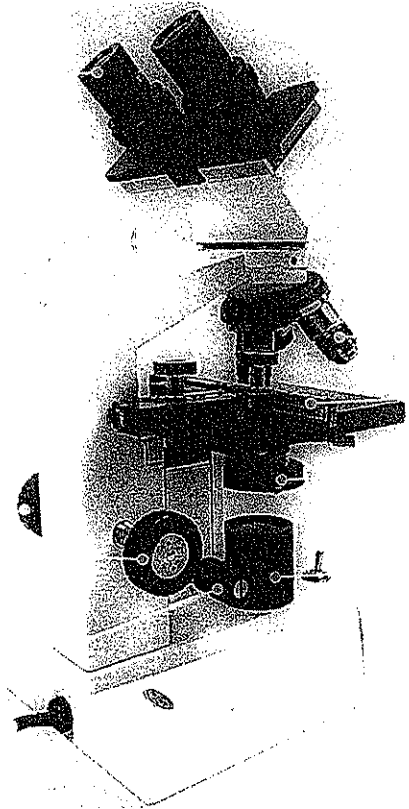
Date \_\_\_\_\_



# Key Components of Compound Light and Dissecting Microscopes

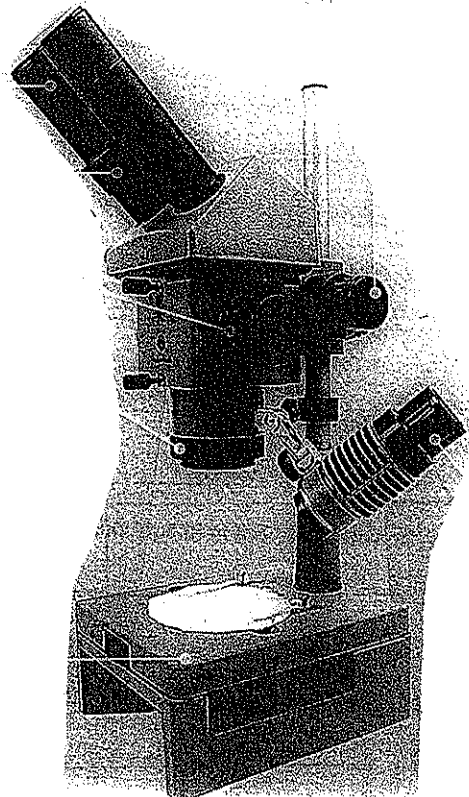
## Compound Light:

- Built-in Light Source
- Arm
- Course focus knob
- Fine focus knob
- Condenser
- Stage
- Stage Clips
- Eyepiece Lens
- Nosepiece
- Objective Lens



## Dissecting Microscopes:

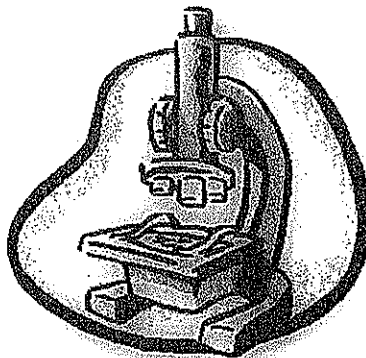
- Focus Knob
- Stage
- Eyepiece Lens
- Objective Lens
- Eyepiece Focus



## Easy Guide To Using A Light Microscope

1. Raise the objectives as far as possible
2. Secure the slide to the stage
3. Turn the LOW POWER objective into position over the stage
4. Look at the stage (Not through the eyepiece!) and lower the objective as close as it will go without touching the slide.
5. Look through the eyepiece and focus slowly using the course adjustment knob. ONLY RAISE THE OBJECTIVE. (Focusing it downward will break the slide!)
6. Once you can view the specimen, complete the focusing using the fine focus.
7. Only when your specimen is completely in focus should you switch to the HIGH POWER objective!
8. When using the high power lens, ONLY FOCUS USING THE FINE FOCUS. (Focusing with the course focus will break the slide!)

Remember! If your image is too dark or too light, adjust the amount of light coming through the aperture by adjusting the diaphragm!



**CONGRATULATIONS!**

## Calculating Magnification

Total Magnification of Specimen =  
Eyepiece Magnification X Objective Magnification

## Resolution

The ability to separate out objects that are close together. The ability to see greater detail.

High resolution



Medium resolution



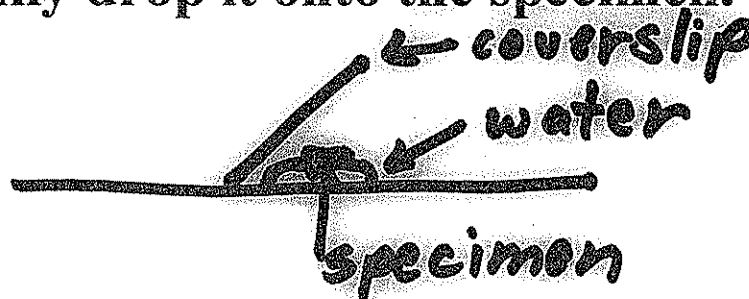
Low resolution



## Preparing and Staining Slides

### Making a Wet-Mount Slide:

- Using a dropper, place a small drop of water in the center of the slide.
- Place the specimen on the center of the slide in the drop of water carefully using a forceps.
- Hold the coverslip at the edge of the drop of water at a 45 degree angle and carefully drop it onto the specimen.



- The water should spread out to the edges of the coverslip but not beyond it.
- If you have used too much water, the water will spill out. If you have not used enough, you will see air bubbles under the coverslip.

### Permanent Mounting:

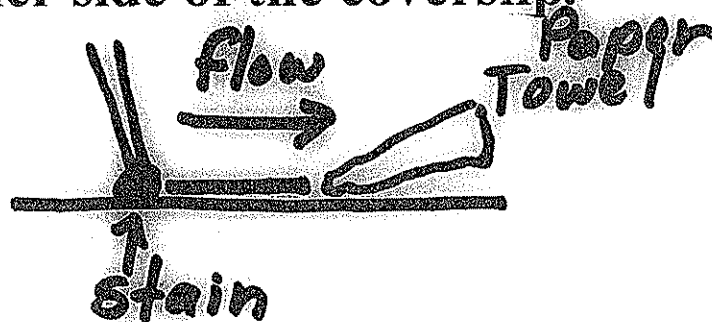
- Follows a different procedure to preserve a specimen indefinitely.

## **Staining a Specimen:**

- **Often specimens viewed under a light microscope are nearly colorless or are sliced so thin that they are difficult to see when they are wet mounted with water.**
- **In this case, a stain is needed.**
- **Stains differentially color different parts or a cell or specimen. For example, some stains color a cell's nucleus more than the cytoplasm, allowing one to see the nucleus easily.**
- **Different stains have different applications (See explanatory handout).**

## How to Stain a Specimen:

- After you have created a wet-mount slide, obtain the stain you will be using.
- Place an absorbent towel on one side of the coverslip and a drop of the stain on the other side of the coverslip.



- The stain should wick through the specimen leaving it fully stained. No bubbles should appear under the coverslip.

## Microscopic World!

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Obtain a pre-prepared slide with letters on it and a microscope before you begin this investigation.

1.) Begin with your microscope on low power (the shortest objective lens) as always. Place your slide on the stage and under the stage clips. Focus first with the coarse adjustment and when the letters begin to come into focus switch to the fine focus to get the best picture. Draw everything you see in the field of view below.

2.) Calculate the magnification of your specimen.

Remember! Total Magnification = Eye piece magnification \* objective magnification

3.) Switch the diaphragm settings from 1 to 5, pausing at each numbered opening. As you change the condenser settings record your observations below. Please be specific.

4.) Observe the direction your letters are facing on the stage. Now observe the direction they are facing when you look through the eyepiece. Record your observations.



5.) What observations can you make about the direction the letter moves when you push the slide away from you? Towards you?

6.) What observations can you make about the direction the letter moves when you push the slide to the right? To the left?

Performance Assessment:

Working With Microscopes

- I carry a microscope safely and with respect to the equipment.

Complete

Partial

Incomplete

- I can identify key pieces to the microscope when quizzed orally.

Complete

Partial

Incomplete

- I can create a wet mount slide and can name the materials needed to do so.

Complete

Partial

Incomplete

- I can correctly focus a microscope including the diaphragm, course and fine adjustment.

Complete

Partial

Incomplete

- I can identify / calculate the "total magnification" of the microscope I am using.

Complete

Partial

Incomplete

Assessed by: \_\_\_\_\_ Date: \_\_\_\_\_

### Biological Drawing

1. Determine the field of view for each of the three objectives on your microscope.
2. On a separate, blank sheet of drawing paper, draw (using IB Drawing Protocol) the item you have selected.
3. Label the item appropriately.
4. Draw a scale bar to represent the size of the object.
5. Indicate the magnification of your drawing on the bottom of your paper.