Using the microscopes and study of Frog blood

Objectives : The student must be able to:

- To handle laboratory equipment and specimens carefully.
- To recall the students of science, practical works are extremely important.

Contents

I. THE MICROSCOPE

- An instrument with the lens or number of lenses for making small objective appear large.
- The ordinary microscope of the laboratory is a compound light microscope with two sets of lenses (i.e.eyepiece and objective lenses) which magnify the object in two steps.

I. PARTS OF A COMPOUND LIGHT MICROSCOPE

1. Eyepiece – To view with the eye
2. Eyepiece sleeve – to hold the eyepiece which should be changeable with x4,x10&x15
3. Body tube – holding the two lenses for magnifying the object with light
4. Coarse adjustment knob – focusing the object under low magnification
5. Fine adjustment knob – focusing the object under high magnification
6. Revolving nosepiece – holding various magnification of objective lens (x14,x10,x40)
7. Objective lens – to magnify the object
8. Arm – holding the body tube and lenses for magnification
9. Clip – to hold the slide on the stage
10. Stage (simple) – to place the object for magnification
11. Stage (mechanical) – with scale and movable appliances
12. Diaphragm – adjust the amount of light entering the tube
13. Condenser (with adjustment knob) – to condense the light from the mirror
14. Mirror (illuminator) – to supply sufficient amount of light for visualization
15. Base – assembling and holding all the parts of a microscope

III. CARE OF THE MICROSCOPE

1. The microscope, being an expensive instrument, must be given proper care.
2. It should always be carried by the arm of the microscope, in an upright position, with one hand holding under the base.
3. When placed on the table, it should be at least six inches away from the edge in order to prevent it from falling accidentally to the floor.
4. The working place should, as far as possible, be free from dust, moisture, chemical vapours and vibration.
5. For work with daylight illumination it is preferable to select a position near the window to get sufficient light. Do not let direct sunlight strike the mirror.
6. Do not touch the objective lenses.
7. When swinging in high power objective, take special care that the front lens does not touch the specimen or slide.
8. At the end of the laboratory period, turn the lower power objective into position and adjust it approximately ½ inch above the stage. Be sure the stage clips do not extend beyond the stage.

IV. HANDLING METHOD OF THE MICROSCOPE

1. The student should always have a clear field of light before attempting to use the microscope. Rotate the revolving nosepiece so that the low power objective (the shortest one) is in line with the body tube. It should click or snap into position.
2. Use the coarse adjustment knob to raise the stage until you reach the stop that.
3. The diaphragm opening should at first be open to its fullest extent.
4. Look through the eyepiece and move the mirror until it reflects light upward through the opening in the stage.
5. Still looking through the eyepiece of the microscope, adjust the mirror and the diaphragm so that the round field of view is evently illuminated and without glare.
6. The concave side of the mirror is used because the light is more intense, since the concave mirror acts like a lens to condense the light from the whole area of the mirror on to that covered by the objective.

V. USING THE MICROSCOPE

1. Place the slide on the stage of the microscope under the low power objective. Center th objective on the slide over the opening in the stage.
2. Then, look into the eyepiece and slowly turn the coarse adjustment knob to lower the stage un the objective comes into view.
3. Turn the fine adjustment knob slightly towards or away from the viewer to make the focus sharp as possible.

VI. CAUTION

1. If the eyepiece or objective is cloudy or dusty, wipe the lenses gently in one direction with piece of lens paper. Do not use any other kind of paper or cloth.
2. Never raise the stage while looking through the eyepiece. You may accidentally ram th objective into the slide, breaking it and damaging the very expensive lens of the objective.
3. When studying under high power magnification, the material must be first located under the low power and then place it in the center of the microscopic field before swinging the high pow objective lens.
4. The fine adjustment knob should never be turned to a complete revolution.
5. As you look through the eyepiece, keep both eyes open. Squinting and closing one eye may produce eyestrain.

VII. Study of Frog blood

Light Microscope

Eye piece lens

Prism box

Objective lens

Handle arm

Clip

Stage knob

Stage

Condenser

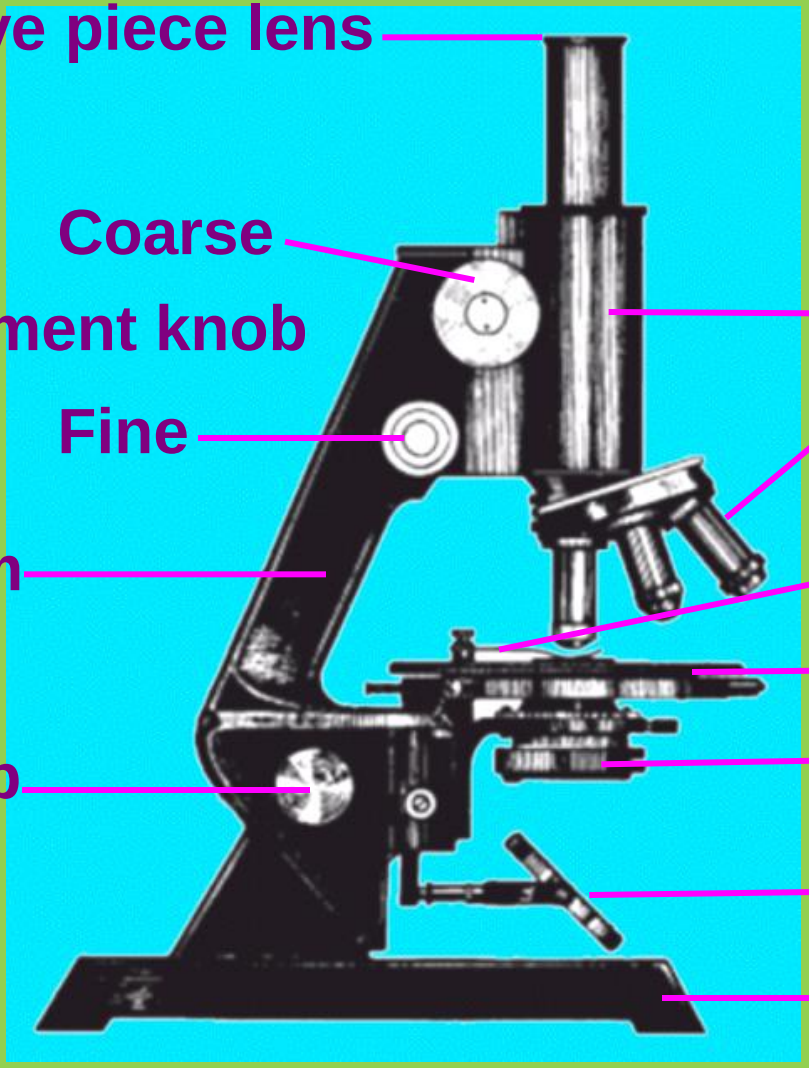
Coarse Adjustment knob

Illuminator

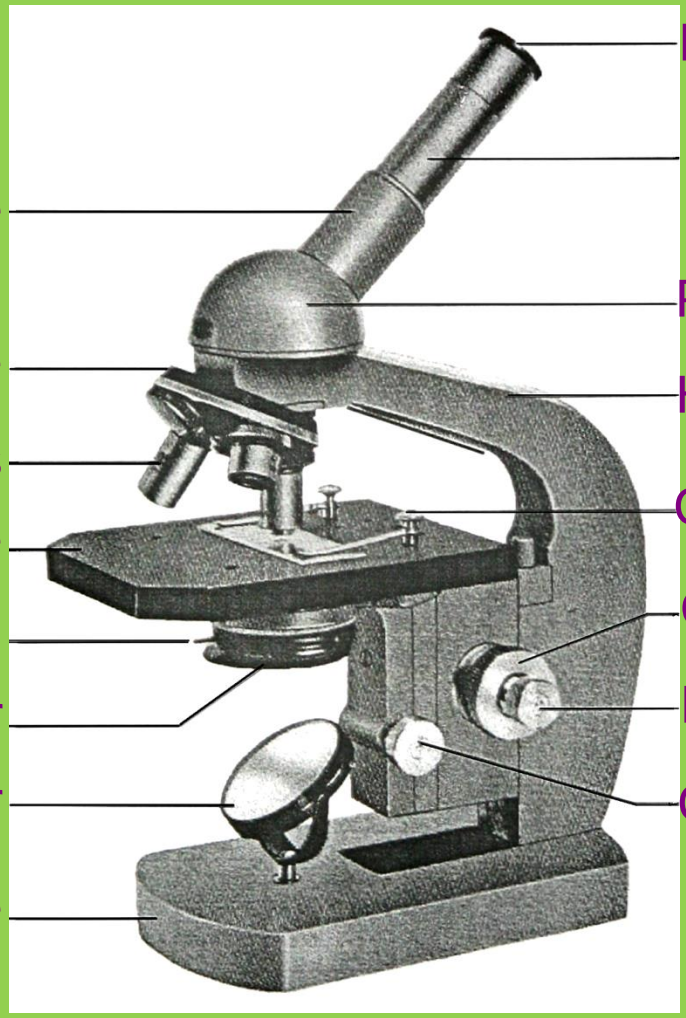
Fine

Base

Light Microscope



Light Microscope



Eye piece lens

Eye piece tube

Body tube

Revolving nose piece

Prism box

Handle arm

Objective lens

Clip

Stage

Coarse

Aperture control

Fine

Adjustment knob

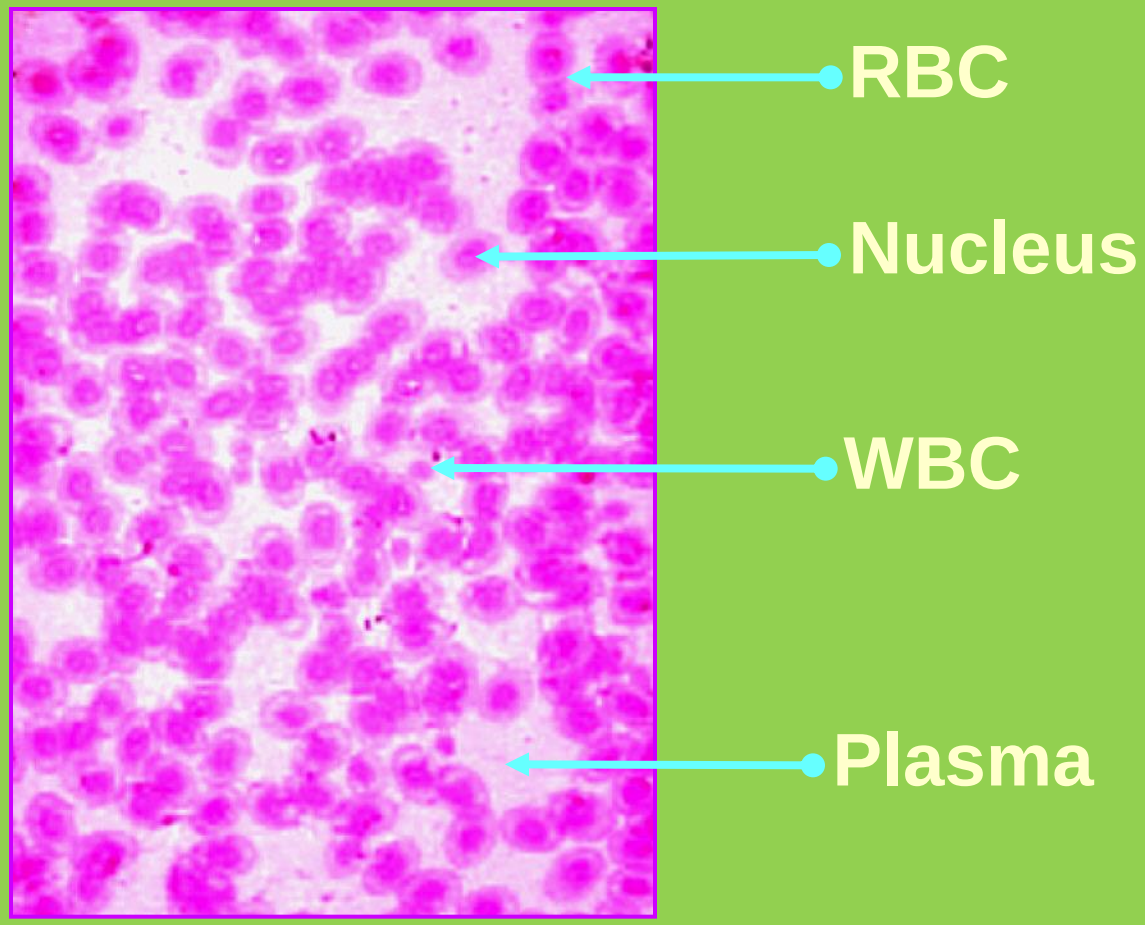
Condenser

Condenser

Mirror

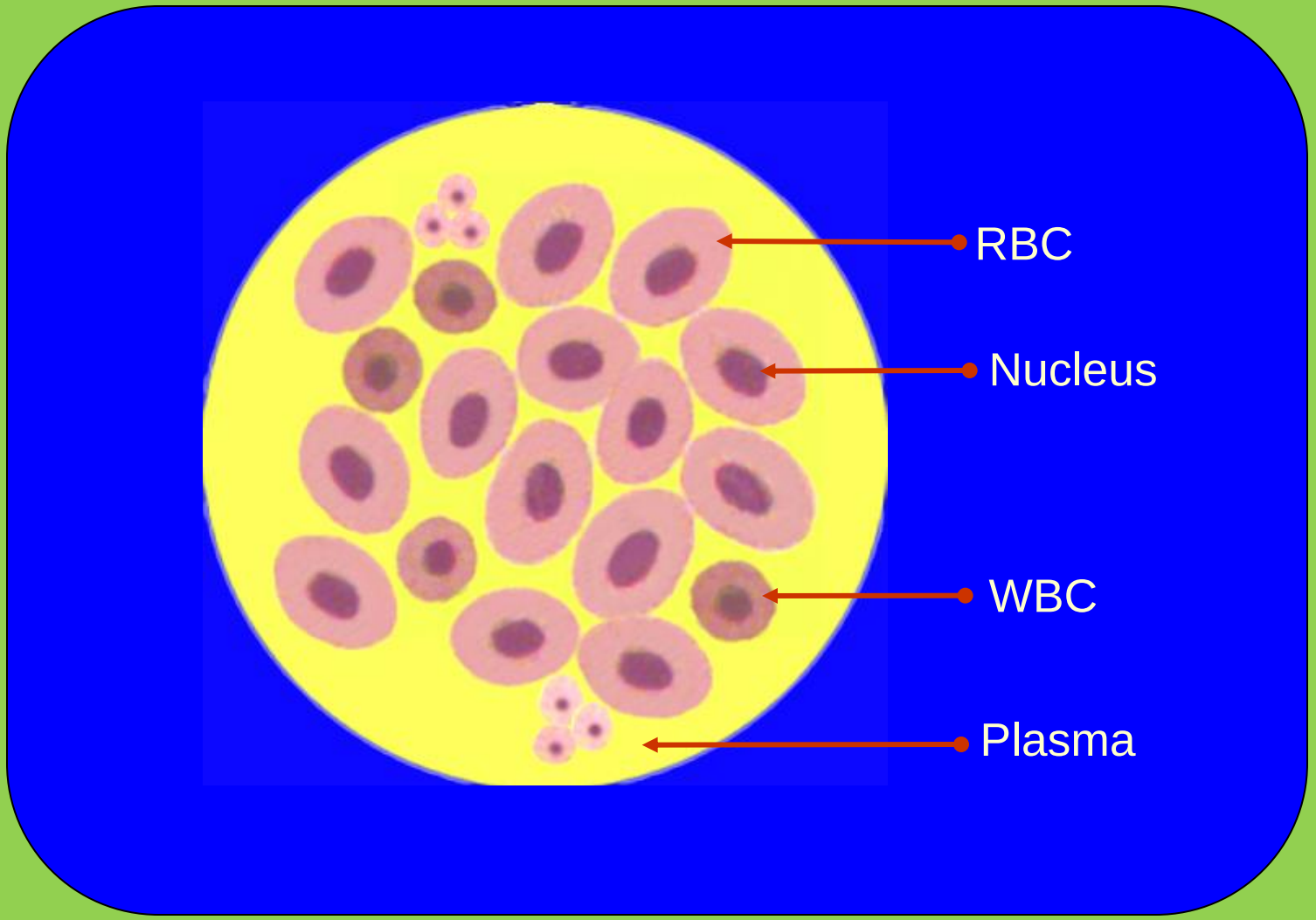
Base

Frog Blood



Low power magnification - 10X

Frog Blood



High power magnification - 40X

Mammalian Blood