

## **Topic: Using a Microscope to View a Prepared Specimen**

I chose to do my procedural analysis on the process of using a compound light microscope to view a pre-prepared specimen in a Biology classroom. This process is one that is of particular importance because it is revisited in future coursework. Learning the proper procedure for microscope operation ensures that students find success in future lab activities and assignments, and protects equipment for future students to use. This procedure assumes that students have a basic understanding of the components that make up a compound light microscope.

### **1. Prepare microscope for use**

- 1.1. Get microscope
  - 1.1.1. Go to microscope storage shelf
  - 1.1.2. Choose any compound light microscope
  - 1.1.3. Pick up microscope
    - 1.1.3.1. Place one hand on the microscope arm
    - 1.1.3.2. Place one hand on the side of the microscope base
    - 1.1.3.3. Gently lift microscope
    - 1.1.3.4. Reposition the hand that was on the side of microscope base to under the microscope base
  - 1.1.4. Place microscope on lab table
    - 1.2.3.1. Slowly walk with microscope to table
    - 1.2.4.2. Gently set microscope on table with the stage facing you
- 1.2. Remove microscope cover
  - 1.2.1. Undo velcro straps
  - 1.2.2. Slip cover over the top of the machine
  - 1.2.3. Set cover aside
- 1.3 Plug in the machine
  - 1.3.1. Unwrap cord
  - 1.3.2. Insert prongs in outlet
- 1.4 Prepare slide stage for use
  - 1.4.1. Check stage height
    - 1.4.1.1. If raised, lower stage all the way down by turning the stage knob towards yourself (counterclockwise)
    - 1.4.1.2. If already in the lowest position leave alone.
- 1.5 Prepare light for use
  - 1.5.1. Click light button on the left side of machine base to the "on" position
    - 1.5.1.1. If light does not come on, notify instructor
  - 1.5.2. Adjust the amount of light let in by the illuminator
    - 1.5.2.1. Turn iris diaphragm clockwise or counterclockwise until the iris diaphragm is 50% open as viewed from the top of stage
  - 1.5.3. Adjust light brightness

- 1.5.3.1 Turn the brightness adjustment knob clockwise or counterclockwise to position it in the middlemost setting
- 1.6. Adjust microscope focus knobs
  - 1.6.1. Turn the fine focus knob either clockwise or counterclockwise until it is pointed at the middlemost dial notch
  - 1.6.2. Turn the coarse focus knob either clockwise or counterclockwise until it is pointed at the middlemost dial notch
- 1.7. Adjust objective lenses
  - 1.7.1. Set the lowest objective lens into viewing position
    - 1.7.1.1. Find the lowest objective lens (4x magnification)
    - 1.7.1.2. Turn revolving nosepiece/turret clockwise or counterclockwise until the lowest objective lens is pointed towards the stage
  - 1.7.2. Check that the objective lens has clicked into place
    - 1.7.2.1. If you see light when you look through the eyepiece, the objective lens is in place. Leave it in position.
    - 1.7.2.2. If you do NOT see light when you look through the eyepiece the objective lens is NOT in place. Adjust the lens until it clicks into place.

## **2. Prepare specimen slide for use**

- 2.1. Choose specimen slide from the box at your lab table
- 2.2. Position specimen slide for viewing
  - 2.2.1. Place specimen slide on stage label side up
  - 2.2.2. Gently slip slide under stage clips
  - 2.2.3. Center slide over aperture

## **3. Find specimen using microscope**

- 3.1. Position stage height
  - 3.1.1. Turn coarse focus adjustment knob slowly towards yourself to raise the stage
    - 3.1.1.1 As you turn the knob look through the eyepieces for any objects
      - 3.1.1.1.1. If you see an object, continue turning until it appears clear then stop
      - 3.1.1.1. 2. If you raise the stage too much and the object begins to get less focused turn the coarse adjustment knob slowly away from yourself until the object is once again in focus
- 3.2. Position stage on X and Y axis
  - 3.2.1 Turn X control knob clockwise until you have centered the object horizontally in the viewing area
    - 3.2.1.1. If you reach the end of the stage and don't see an object, turn control knob counterclockwise until the object is centered horizontally in the viewing area
  - 3.2.2. Turn Y control knob clockwise until you have centered the object vertically in the viewing area

3.2.2.1. If you reach the end of the stage and don't see an object, turn control knob counterclockwise until the object is centered vertically in the viewing area

## **4. Focus your microscope on the specimen**

### **4.1. Adjust fine focus**

4.1.1. Turn fine focus adjustment knob very slowly towards yourself to raise stage

4.1.1.1 Make sure to use very slight movements when turning the fine adjustment knob or you might crack the slide

4.1.1.2 As you turn the knob look through the eyepieces at your object

4.1.1.2.1. Continue turning until the object becomes clearer

4.1.1.2.2. If you raise the stage too much and the object begins to get less focused turn the fine adjustment knob slowly away from yourself until the object is once again in focus

## **5. Get a closer view of your specimen**

### **5.1. Set the middle objective lens into viewing position**

5.1.1. Find the objective lens titled labeled 10x magnification

5.1.2. Turn revolving nosepiece/turret clockwise or counterclockwise until the 10x magnification objective lens is pointed towards the stage

5.1.3. Check that the objective lens has clicked into place

5.1.3.1. If you see light when you look through the eyepiece, the objective lens is in place. Leave it in position.

5.1.3.2. If you do NOT see light when you look through the eyepiece the objective lens is NOT in place. Adjust the lens until it clicks into place.

### **5.2. Re-focus on the specimen at 10x magnification**

5.2.1. Do NOT touch the coarse focus adjustment knob

5.2.2. Turn fine focus adjustment knob very slowly towards yourself to raise stage

5.2.2.1 Make sure to use very slight movements when turning the fine adjustment knob or you might crack the slide

5.2.2.2 As you turn the knob look through the eyepieces at your object

5.2.2.2.1. Continue turning until the object becomes clearer

5.2.2.2.2. If you raise the stage too much and the object begins to get less focused turn the fine adjustment knob slowly away from yourself until the object is once again in focus

### **5.3. Set the highest objective lens into viewing position**

5.3.1. Find the objective lens titled labeled 40x magnification

5.3.2. Turn revolving nosepiece/turret clockwise or counterclockwise until the 40x magnification objective lens is pointed towards the stage

5.3.3. Check that the objective lens has clicked into place

5.1.3.1. If you see light when you look through the eyepiece, the objective lens is in place. Leave it in position.

5.1.3.2. If you do NOT see light when you look through the eyepiece the objective lens is NOT in place. Adjust the lens until it clicks into place.

### **5.4. Re-focus on the specimen at 40x magnification**

5.4.1. Do NOT touch the coarse focus adjustment knob

- 5.4.2. Turn fine focus adjustment knob very slowly towards yourself to raise stage
  - 5.4.2.1 Make sure to use *very* slight movements when turning the fine adjustment knob or you might crack the slide
  - 5.4.2.2 As you turn the knob look through the eyepieces at your object
    - 5.4.2.2.1. Continue turning until the object becomes clearer
    - 5.4.2.2.2. If you raise the stage too much and the object begins to get less focused turn the fine adjustment knob slowly away from yourself until the object is once again in focus

## **6. Check results with instructor**

- 6.1. When satisfied that your specimen is in focus on the highest objective lens...
  - 6.1.1. Turn off your microscope light
  - 6.2.1. Raise your hand
  - 6.3.1. Wait for instructor approval and additional instructions