

BASIC MICROSCOPY with the OLYMPUS CH-22

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Retrieving your Microscope

1. Pick up your microscope with two hands. Grab the arm of the microscope with one hand and place your other hand under the base for support.
2. Place the microscope so that the arm is away from you. Turn the head so that the oculars (eyepieces) face you.

Setting up the Microscope

1. Plug in the cord. (The most common reason why most appliances fail is a lack of power.)
2. Turn the light on with the switch in the front. You can control light intensity with the rheostat on the right hand side (___ is lowest, ___ is highest).
3. Raise the condenser to its highest point. Adjust the dial on the condenser (iris diaphragm) to the leftmost point. What number and letter pointing to the front?
4. Make sure that 4x objective lens is seated properly.
5. Put some mark on a slide and clip it into the mechanical stage. Try turning the knobs of the mechanical stage to observe if the slide moves back-and-forth and right-to-left smoothly.
6. Raise the stage to its highest level using the course focus adjustment (inner, wider knob). Use the coarse focus to bring your image into view and then sharpen it with the fine focus adjustment (outer, smaller knob).
 - a. HINT – It is easiest to determine if you are looking at the slide if you move the stage with one hand (your right) while you are focusing with the other (your left).
7. Adjust the spacing for the oculars so that you can comfortably see with both eyes. There is a scale on the head that can provide you an easy measure of your eye width.
8. The left ocular is adjustable so that both eyes can be set to focus on the same plane. Close your left eye and focus on a specific spot **using the fine focus adjustment** and your right eye only. Now open your left eye, close your right, and adjust the focus **using the diopter ring around the left ocular**. Again, there is a scale that can help you memorize the precise settings for your eyes.
 - a. HINT – It will make you feel nauseated if your two eyes are not seeing the same thing.
9. Adjust the iris diaphragm until the light just begins to dim. This is the point of **maximum depth of field and resolution**.
 - a. NOTE – The iris diaphragm will need to be adjusted with each increase in magnification.
 - b. NOTE – You are now seeing your object magnified **40x** (10x magnification from the ocular and 4x magnification from the objective multiplied together).

Increasing Magnification

1. Rotate the objective turret to the 10x lens. The objectives are par focal (they focus on the same plane), so the object should be in focus (or nearly so due to decreased depth of field with increased magnification). Adjust **the fine focus knob only**.
 - a. NOTE – The object is now magnified 100x (Why?)
2. Rotate the objective turret to the 40x lens, and **adjust the fine focus ONLY**.
 - a. **WARNING – Rotating the course adjustment may cause the lens to grind into the slide. This can damage the lens.**
 - b. NOTE – How much is the object on the stage now magnified?

Switching to Oil Immersion

1. Rotate the turret halfway towards the 100x oil immersion lens. Place a drop of immersion oil on the slide above the condenser (where the light is shining) and rotate the 100x lens into position. If the set up is correct, the lens will enter the oil (that is necessary for the lens to work) but not scrap the slide.
 - a. **If you lose the object, DO NOT RETURN TO THE 40x OBJECTIVE since that will get oil on that lens also, and the 40x lens will not work with oil on it. Instead, rotate the other direction to the 10x lens and focus again on the object.**
 - b. **WARNING – Do not adjust the course focus controls since this will make it MUCH HARDER to find your subject again.**
 - c. **WARNING – Do not adjust the course focus control while using the oil immersion lens. You can easily grind the lens into the slide.**
2. To view a new slide, rotate the 4x objective into position, remove the old slide, and clip a new slide onto the stage.
 - a. HINT – There is no need to clean the oil off of the oil immersion lens until all the observations are finished.
 - b. HINT – **Do NOT move the stage** when you insert a new slide. The stage is currently set in a position that should focus on the new slide with a slight adjustment of the fine focus.

Returning your Microscope

1. **Remove any slides** left on the stage and store them appropriately.
2. **Blot the oil immersion lens dry** with lens paper.
3. Clean the outside of the oculars, objectives, top of the condenser and light source with lens paper.
4. Switch **THE OBJECTIVE TO THE 4x lens**.
5. **Center the mechanical stage** so that the slide holder is not extended out to the left. Leaving the stage clip overextended to the left can cause the microscope cover to tear.
6. Place the cover on the microscope.