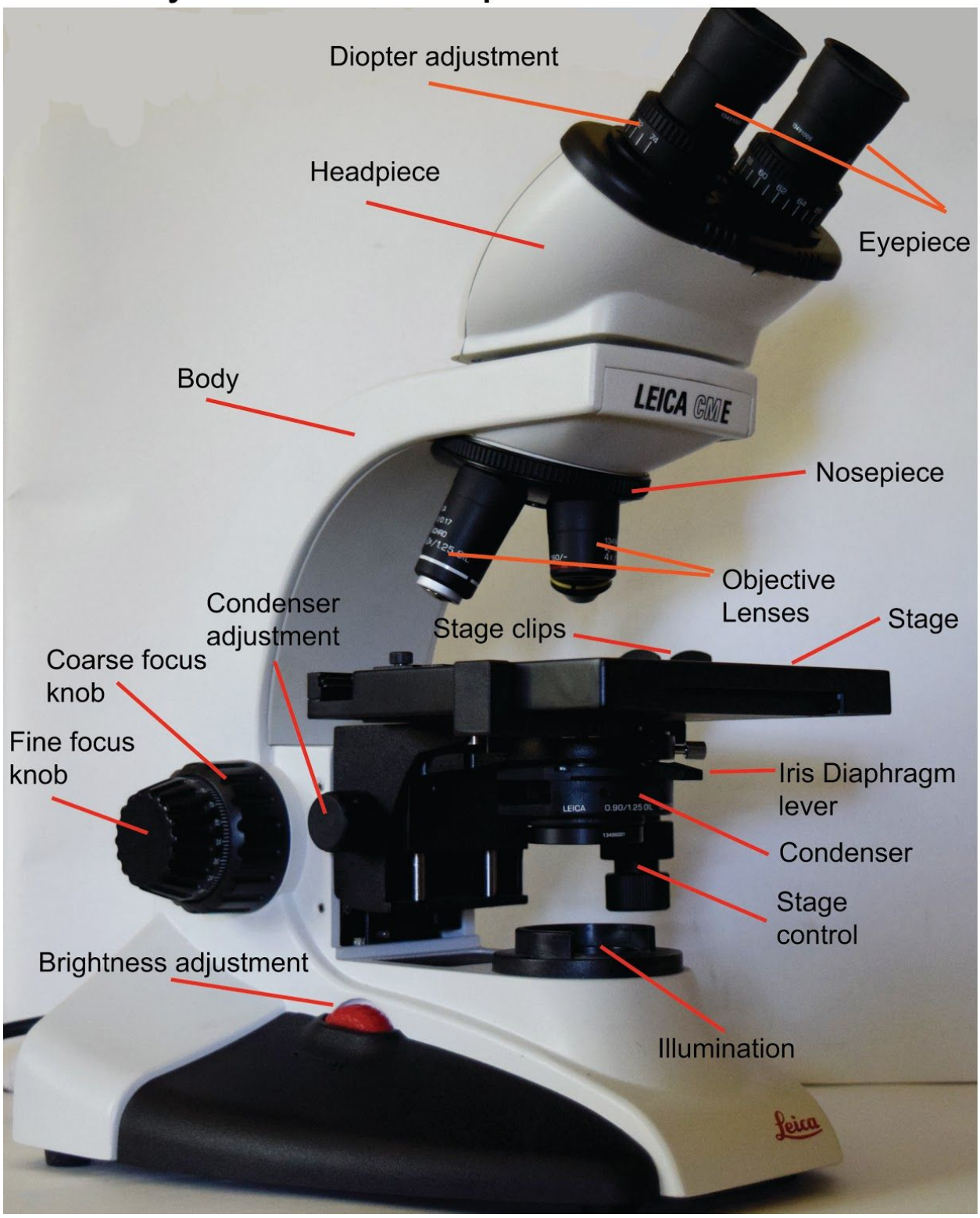
Anatomy of a Microscope



Microscope Session 1:

Microscope parts and function
https://www.microscopemaster.com/parts-of-a-compound-microscope.html

Eyepiece: The lenses the viewer looks through to see the specimen. The eyepiece usually contains a 10X or 15X power lens.

1. **Diopter Adjustment**: Useful as a means to change focus on one or two eyepieces so as to correct for any differences in vision between your two eyes. Make sure you are focusing on the same plane with both eyes.

Headpiece: Connects eyepiece to objective lenses.

Body: Goes from the head and nose piece to the bottom part of the microscope that houses the lamp and brightness control.

Nosepiece: A rotating turret that houses the objective lenses. The viewer spins the nosepiece to select different objective lenses.

Objective Lenses: They are the lenses closest to the specimen. A standard microscope has three, four, or five objective lenses that range in power from 4X to 100X. When focusing the microscope, be careful that the objective lens doesn't touch the slide, as it could break the slide and destroy the specimen. Your lenses are parfocal, so correctly focusing the 4X Objective Lens should mean they are all in the correct position.

Coarse Focus Knob: Use at 4X to bring the sample into focus and aligns lenses (Parfocal).

Fine Focus Knob: Use at 10X and 40X to bring organisms into focus.

Stage: The flat platform where the slide is placed.

Stage clips: Metal clips that hold the slide in place.

Stage Control: Use this to move the slide around, think X and Y axes.

Aperture: The opening that allows the light through to the slide.

On/off switch for illumination: This switch on the base of the microscope turns the illuminator off and on.

Brightness Control: Allows light to be brighter or dimmer.

Iris diaphragm: Adjusts the amount of light that reaches the specimen. Increases contrast by developing shadows.

Condenser: Focuses light from the illuminator onto the specimen being viewed.
Condenser Adjustment: Moves condenser up and down to focus light on the sample correctly.

Calibrate dropper by volume

(*supplies needed: pipette, jar with clean spring water (no chlorine/chloramine), a test tube with a clear 1 ml or 2 ml mark*)

Microscope Session 2:

Prepare Sample (*need compost or soil sample, pipette, clean spring water (no chlorine/chloramine), graduated 15ml test tube with lid, test tube stand, slide, coverslip, bowl for 'dirty' water, lint-free towel to clean slide/coverslip*)

- Describe how the sample was gathered/mixed.
- Describe how much sample material is used.
- Describe and perform dilutions.
- Apply 1-2 drops (take note) on the slide; spread drop with the coverslip.

Adjust the microscope for the first time in the day.

- Place sample on stage secured with stage-clip.
- Turn on the light source, turn down intensity, initially.
- Adjust the distance between the eyepieces until only one circle of light in FOV.
- Dial-in 4X Objective and raise the stage to the highest setting.
- View through the Eyepiece and bring the sample into focus with the Coarse Focus Knob (moving the stage down).
- Dial-in 10X Objective and focus on the sample with the Fine Focus Knob.
- At 10X, focus light through the Condenser on the sample using the edge of a piece of paper across the light source as outlined in the FC Course Manual. The edge of the paper should be in sharp focus and find the middle of the blue-red shift. Adjust the Iris Diaphragm for shadowing as outlined in the FC Course Manual.
- Dial-in 40X Objective and focus using the Fine Focus Knob.

- Adjust the light to higher intensity, if necessary.
- Adjust Eyepieces so the image is in focus for both eyes.

1. If Diopter on only one Eyepiece, close your eye that matches the Eyepiece that does have a Diopter. Use the Fine Focus Knob to bring the sample into a crisp focus using your eye/Eyepiece without the Diopter.
2. Close the eye that you just used in #1 and open your other eye (the one with the Diopter on the Eyepiece). Use the adjustment ring on the Diopter to adjust the focus for the currently open eye. The image should now be very crisp and clear for each individual eye, and both eyes together. Now the sample is in the same plane of focus for both eyes.
3. If you have 2 Diopters, then choose one eyepiece and close that eye to start and follow the procedure above.