Microscopy - Chapter 1

Lecture 1

Using the Compound Microscope for Shadowing Microscopy (Part 1)

Storing Microscopes

- ALWAYS remember to place the dust cover on the microscope when it is not in use.
- Dirt and dust get into the stage gears and focusing ability becomes difficult.
- Dust gets into the internal lenses of the microscope and you should not attempt to remove that dust. Let a professional do it.

Ordering a Microscope

- Students should have a shadowing microscope for this class --- borrow or buy! Additionally, if your microscope did not come with all the accessories listed in following slides, please order them.

- www.soilfoodweb.com has the requirements for shadowing microscopes and suggestions about where to find reasonably priced microscopes.

- If you need clarification or have problems, contact us.

Shadowing Microscope Requirements

- **Total magnification:** 40X-100X-250X-400X; higher magnification is not needed
  - Eyepieces: wide field WF10X; higher magnification eyepieces generally decrease resolution
  - Objective lenses: Achromatic DIN 4X, 10X, 40X(S)
- **Viewing head:** 45 degrees inclined 360 degrees swiveling trinocular
  - Sliding adjustable interpupillary distance: 2-3/16inch ~ 2-15/16inch(55mm ~ 75mm)
  - Ocular diopter adjustable on both eye tubes
- **Nosepiece:** Revolving quadruple (i.e. space for 4 objective lenses)
- **Focus adjustment:** Coaxial coarse and fine knobs on both sides
- **Stage:** Mechanical double layer size: 4-1/2inch x 4-15/16inch (115mm x 125mm)
  - Stage x-y stroke (travel range): 2-13/16inch x 1-3/16inch (70mm x 30mm)
- **Condenser and diaphragm:** NA 1.25 Abbe condenser **with iris diaphragm**
- **Transmitted (lower) illuminator:** LED light, intensity adjustable
- **Power supply:** AC/DC adapter, 100V-240V (UL approved)
- 5-year warranty against manufacturing defects

Microscope Accessories

1. Slides - Size: 3.6 x 3.1 x 1.2 inches

2. Coverslips - Square Cover Glass, 18mm x 18mm Size, No. #1.5 Thickness (0.17 mm)

3. Test tubes - Size: 15ml, conical bottom, plastic, with screw top lid. Make certain the tubes ordered have the 1 ml mark

4. Transfer Pipettes - Karter Scientific 206H2 - 3ml Graduated Transfer Pipettes, Vol 7ml, 1/2ml Graduations, 155mm, Pack of 500 for $13.89

5. Gosky Universal Mount for holding cell phone in position for taking microscope picture; *https://www.amazon.com/gp/product/B013D2ULO6/ref=oh_aui_search_detailpage?ie=UTF8&p sc=1*

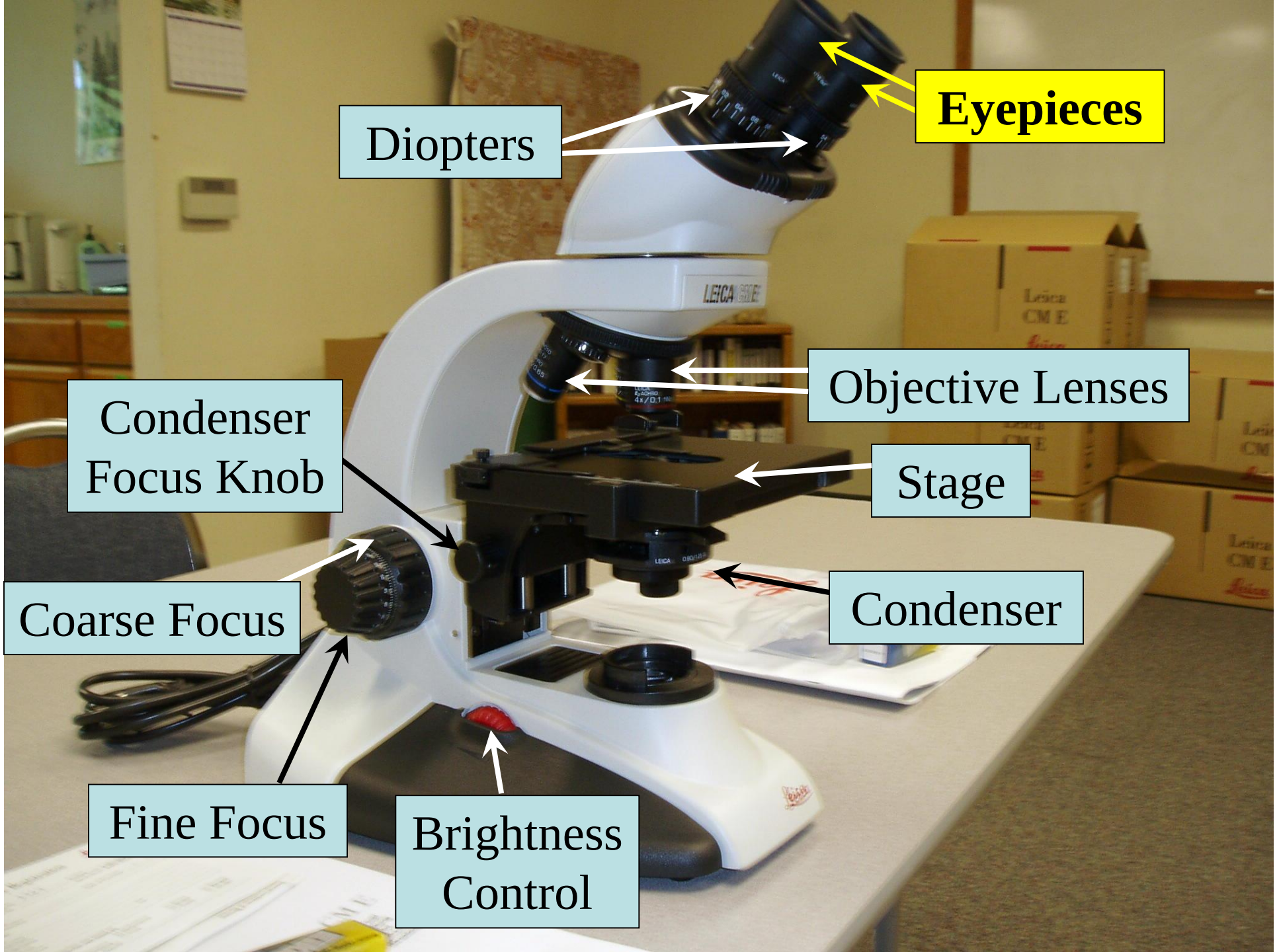
Check with *info@soilfoodweb.com* to see if we have smaller quantities of these things available.

Microscopes should be professionally cleaned about once a year.

Any place that sells microscopes should have a specialist. You can also check with hospitals, high schools, and medical clinics.

Storing Microscopes

- ALWAYS remember to place the dust cover on the microscope when it is not in use.
- Dirt and dust get into the stage gears and focusing ability becomes difficult.
- Dust gets into the internal lenses of the microscope and you should not attempt to remove that dust. Let a professional do it.


Eyepieces
Diopters
Objective Lenses
Condenser Focus Knob
Stage
Condenser
Coarse Focus
Fine Focus
Brightness Control

Microscope Parts: Lamp and Eyepieces

Please find all the important parts of the microscope and make sure you can operate them correctly.

1.Lamp: Plug the microscope in. Turn the lamp (bottom of the microscope) on. Adjust the brightness knob for your eyes.

2.Eyepieces: Look through the eyepieces. There should be ¼ - ½ inch between your eyes and the eyepieces. Adjust the two eyepieces just as you would a pair of binoculars. A single round field of view should be seen. You may need to move your eyes farther away from the eyepieces, or closer as you adjust the distance between the eyepieces until you see one circle of light.

Microscope Parts:
Diopters and Objective Lenses

3. **Diopters:** Less expensive microscopes will have only one eyepiece with a diopter, while more expensive microscope will have both eyepieces with diopters. In both situations, turn the diopter so the eyepiece is at the lowest point. Your eyes are now focused at the same point on the focal plane, and most people's eyes are not well-aligned. Thus you need to adjust the focal plane in order to prevent excruciating headaches.

4. **Objective Lenses:** Only three objective lenses are needed for this work; a 4X scanning lens, a 10X or 20X lens, and a 40X working lens. Most measurements are performed using the 40X objective. But to start, dial the 4X lens into alignment with the sample. Move the stage to the highest point, using the coarse focus knob. There are coarse focus knobs on both sides of the microscope.