APPENDIX A
MICROSCOPE USE & CARE

MICROSCOPE USE

General Microscope Use

1. Become familiar with the following parts of the Compound microscopes: Dust cover, Eyepieces, Stage, Objectives, Power Switch, Illumination Control, Sub-stage Condenser, Iris Diaphragm, Field diaphragm, "Coordinate" Stage Controls, Coarse Focus, Fine Focus, Pointer Switches & Controller.

2. Instructions for Basic Use
   - Turn on power switch and adjust illumination to about level 6
   - Rotate objectives to the 4X objective
   - Place slide on stage
   - Using the Coordinate stage controls move the slide until a corner of the coverslip is below the 4X objective.
   - Open field diaphragm completely.
   - Move substage condenser until it is about 0.5mm from the bottom of the slide.
   - Once the substage condenser, the field diaphragm, & the illumination control are set, only the iris diaphragm should be utilized to adjust illumination.
   - **Adjust the iris diaphragm until the illumination is the darkest. This is the best setting for viewing helminth ova, protozoan cysts and other cuticular structures.** Again, ONLY adjust the iris diaphragm as needed, to increase or decrease illumination.
   - Utilize the Coarse Focus to focus on the corner of the cover slip.
   - Move slide with the coordinate stage controls to the specimen to be observed. Then use the Fine Focus to get the specimen in clear focus.
   - To increase magnification, rotate objectives so that the 10X objective is above the specimen. ONLY use the Fine Focus to focus the specimen. (Warning: Use of the Coarse Focus while using the 10X, 40X, or 100X objectives may result in the objective being driven through the slide.) The iris diaphragm may need to be adjusted also.
   - To increase magnification to 40X repeat the step above.
   - To increase magnification to 100X (oil immersion):
     a. Rotate the objectives so specimen is half-way between 40X & 100X objectives.
     b. Place a SMALL drop of immersion oil on specimen, (use light from condenser as a guide).
     c. Rotate 100X objective into the oil.
     d. Utilize Fine Focus **ONLY** to get specimen in clear focus.
     e. Again, the iris diaphragm may need to be adjusted.

   - Utilize the "Use and Care of Olympus Dual-headed Microscopes" handout for a complete explanation of microscope use.

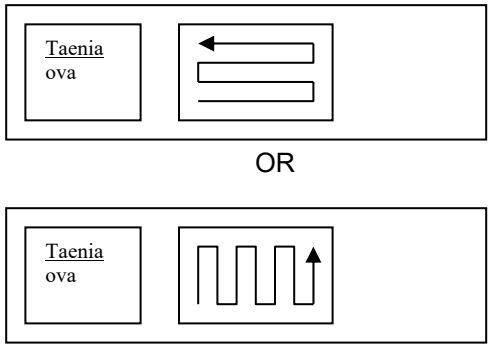
MICROSCOPE CARE

- Clean the body & stage of the microscope with Paper towels or Kim-wipes.
- Clean the Oculars (eyepieces) & Objectives with **LENS-PAPER ONLY**. Use optics cleaner if necessary.
- Flotation solutions are very corrosive and will damage the sub-stage condenser; spills must be cleaned immediately.
- Clean immersion oil (with **LENS PAPER**) from the objectives immediately.
- Turn off microscope light and **pointer** light.
- Replace dust covers.

OTHER MICROSCOPE NOTES

- **Remember: The iris diaphragm may be closed down for improved visualization of ova, cysts, and cuticular structures.**
- **Carefully**, clean slides with Kim-wipes or Paper towels. Use optics cleaner or alcohol if slide is oily.
- Progressively & systematically scan slides for small specimens, ova, & cysts. See Figure #1 below.

Figure #1: Scanning for small specimens, ova, & cysts.



- **Total magnification = Ocular (eyepiece) magnification X Objective magnification.** The Ocular (eyepiece) magnification for these Compound Microscopes is 10X. Thus, while utilizing the 40X objective the total magnification is: 10 (ocular) X 40 (objective) = 400 mag.. What is the total magnification when using the 4X objective? … 10X objective? … 40X objective? … 100X (oil immersion) objective?
- Note: In this lab manual 4X, 10X, 40X & 100X refers to the objective that should be used, **NOT** the total magnification.
- Learn to adjust the eyepieces to your vision (see: Use and Care of Olympus Dual-headed Microscopes).
- Try your best to utilize both eyes, once you get accustom to using both eyes, specimens will be much clearer and seen in 3-D.
- While the specimen is being held up to the light or held above a black surface, mentally note the "size" of specimens viewed with the naked-eye.
- Also mentally compare the "size" of specimens when viewed with the 4X objective, …10X (if needed), … 40X(if needed), & … 100X (if needed).
- Utilize the "Coordinate System" on the stage to quickly "go back to" hard to find specimens.
- If there are any problems with microscopes or pointers notify the Lab Instructor