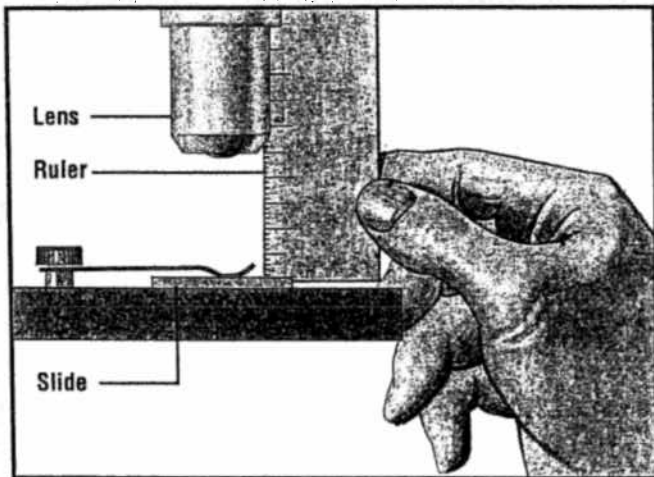


- 13 Turn on the substage light. If your microscope has a mirror, make sure that it is adjusted to reflect the light through the objective lens.

CAUTION: Never use direct sunlight.

- 14 Rotate the coarse-adjustment knob forward so that the low-power objective approaches the slide. Do not allow the objective to touch the slide.
- 15 View the crossed threads by slowly rotating the coarse-focus knob. At this point you may wish to adjust the diaphragm for better lighting.
- c) Are both threads in focus?
- 16 Use the fine adjustment to focus on the top thread.
- d) Measure and record the distance (in mm) between the bottom of the objective lens and the top of the cover slip.



- 17 Rotate the revolving nosepiece to the medium-power objective. The objectives in most microscopes are *parfocal*, which means that once the low-power objective is in focus, the higher-power lenses are in focus. Usually some minor adjustment is required for sharp focusing. If your microscope is not parfocal, check with your teacher for special instructions.
- 18 Use the fine adjustment to focus on the upper thread. As a matter of procedure, always bring the image into focus with the low-power objective first and then proceed to use higher-power objectives. The coarse adjustment should only be used for low-power focusing.

CAUTION: Never use the coarse adjustment for high-power objectives.

- e) Measure and record the distance between the cover slip and the objective lens.
- 19 Rotate the nosepiece to the high-power objective and fine focus.
- f) Measure and record the distance between the cover slip and the objective lens.
- g) As you move from the low- to higher-power objectives, describe the change in light intensity.
- h) Which objective is the best for showing the detail of the threads?
- i) Under which objective is the bottom thread clearest when the top thread is in focus? (You may wish to re-examine the threads with each of the magnifications.)

Part 4: The Field of View

The circle of light seen through the microscope is called the *field of view*. It represents the observed area.

- 20 Switch the nosepiece to the low-power objective and examine the length of thread seen.
- 21 Repeat the procedure for the medium- and high-power objectives:
- j) Compare the length of thread seen under each objective.
- 22 Clean the slide and cover slip and return them to their appropriate location. Rotate the nosepiece to the low-power objective and return the microscope to the storage area.

Laboratory Application Questions

- 1) Explain why microscopes are stored with the low-power objective lens in position.
- 2) *Astigmatism* is a common disorder in which the lens of the eye has an asymmetrical shape. Most people have symmetrical lenses—the top half is identical in shape to the bottom half. Explain why individuals who have astigmatism may experience difficulties distinguishing fine detail with the naked eye.
- 3) Explain why resolving power decreases as the thickness of the objective lenses increases.
- 4) Why should the coarse-adjustment focus not be used with a high-power objective lens?
- 5) The microscope invented by van Leeuwenhoek consisted of a single lens. What advantages do compound microscopes have over single-lens microscopes? ■