Instructors may assign a portion of the Review Sheet questions using Mastering A&P™

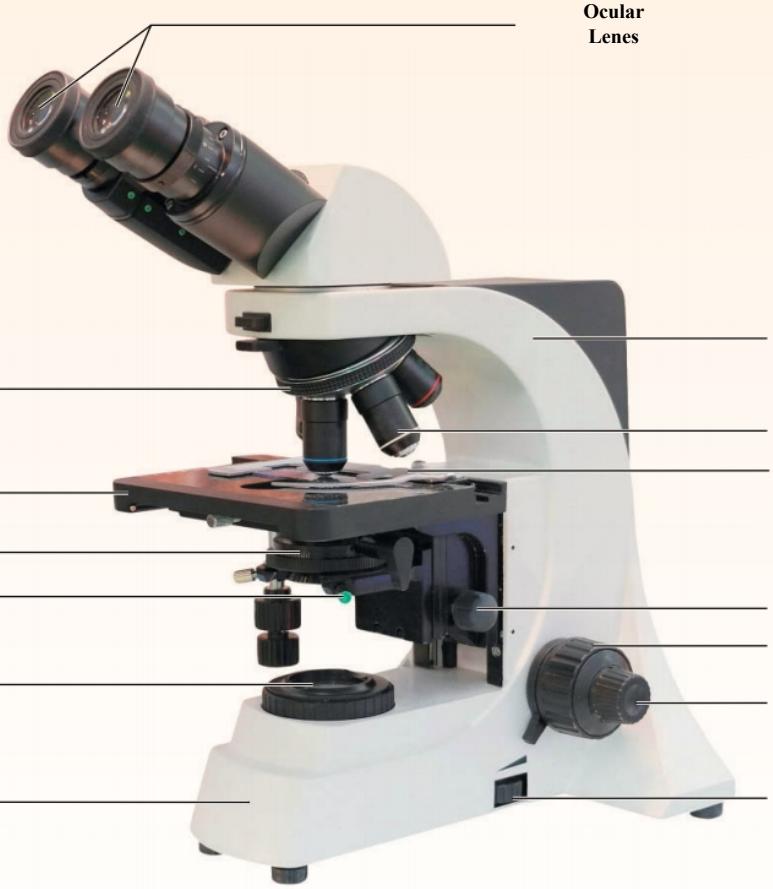
EXERCISE 3

REVIEW SHEET
The Microscope

Name Trevor Wright Lab Time/Date

Care and Structure of the Compound Microscope

1. Label all indicated parts of the microscope.



2. Explain the proper technique for transporting the microscope.

Use two hands to carry the microscope. One supporting the base, the other holding the arm.

3. Each of the following statements is either true or false. If true, write *T* on the answer blank. If false, correct the statement by writing on the blank the proper word or phrase to replace the one that is underlined.

with grit-free lens paper 1. The microscope lens may be cleaned with any soft tissue.

low-power or scanning 2. The microscope should be stored with the oil immersion lens in position over the stage.

Text 3. When beginning to focus, use the scanning objective lens.

Text 4. When focusing on high power, always use the coarse adjustment knob to focus.

Text 5. A coverslip should always be used with wet mounts.

4. Match the microscope structures in column B with the statements in column A that identify or describe them.

Column A		Column B
i	1. platform on which the slide rests for viewing	a. coarse adjustment knob
d	2. used to adjust the amount of light passing through the specimen	b. condenser
e	3. controls the movement of the slide on the stage	c. fine adjustment knob
b	4. delivers a concentrated beam of light to the specimen	d. iris diaphragm lever
c	5. used for precise focusing once initial focusing has been done	e. mechanical stage
f	6. carries the objective lenses; rotates so that the different objective lenses can be brought into position over the specimena.	f. nosepiece
		g. objective lenses
		h. ocular lens
		i. stage

5. Define the following terms.

total magnification: The power of the ocular lens multiplied by the power of the objective lens used.

resolution: Ability to discriminate two closely situated objects as separate.

Viewing Objects Through the Microscope

6. Complete, or respond to, the following statements:

working distance 1. The distance from the bottom of the objective lens to the surface of the slide is called the _____.

to the left 2. Assume there is an object on the left side of the field that you want to bring to the center (that is, toward the apparent right). In what direction would you move your slide? _____.

field 3. The area of the slide seen when looking through the microscope is the _____.

95 4. If a microscope has a 10× ocular lens and the total magnification is 950×, the objective lens in use at that time is _____ ×.

increases contrast

5. Why should the light be dimmed when looking at living (nearly transparent) cells?

parfocal

6. If, after focusing in low power, you need to use only the fine adjustment to focus the specimen at the higher powers, the microscope is said to be _____.

0.75

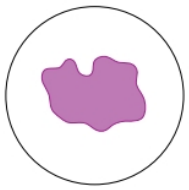
7. You are using a 10× ocular and a 15× objective, and the field diameter is 1.5 mm. The approximate field size with a 30× objective is _____ mm.

0.4

8. If the diameter of the low-power field is 1.5 mm, an object that occupies approximately a third of that field has an estimated diameter of _____ mm.

7. You have been asked to prepare a slide with the letter *F* on it (as shown below). In the circle below, draw the *F* as seen in the low-power field.

8. Estimate the length (longest dimension) of the object in µm:



Total magnification = 100×

Field diameter = 1.6 mm

Length of object = _____ µm

9. Say you are observing an object in the low-power field. When you switch to high power, it is no longer in your field of view.

Why might this occur? **The field decreases proportionately as magnification increases. Only when the object is centered at low power, will it be outside the high-power field.**

What should you do initially to prevent this from happening? **Center the object that you would like to view.**

10. Do the following factors increase or decrease as one moves to higher magnifications with the microscope?

resolution: **increases (to a point)** amount of light needed: **increases**

working distance: **decreases** depth of field: **decreases**

11. A student has the high-power lens in position and appears to be intently observing the specimen. The instructor, noting a working distance of about 1 cm, knows the student isn't actually seeing the specimen.

How so? **The working distance for the high power lens is closer to 1mm.**

12. Describe the proper procedure for preparing a wet mount.

Place the specimen on a slide using a medicine dropper > mix specimen in the drop using a toothpick

When staining, add a of stain and mis using a toothpick > hold a coverslip with forceps so that the coverslip touches one side of the specimen drop > safely, very carefully and slowly, lower the angled coverslip onto the specimen

13. Indicate the probable cause of the following situations during use of a microscope.

a. Only half of the field is illuminated: **The lens is not correctly rotated in place.**

b. The visible field does not change as the mechanical stage is moved:

The slide isn't correctly positioned in the clamp on the mechanical stage and doesn't move when the mechanical stage does.

14. A blood smear is used to diagnose malaria. In patients with malaria, the protozoa can be found near and inside red blood cells. Explain why a microscope capable of high magnification and high resolution would be needed to diagnose malaria.

15. Histopathology is the use of microscopes to view tissues to diagnose and track the progression of diseases. Why are thin slices of tissue ideal for this procedure?