

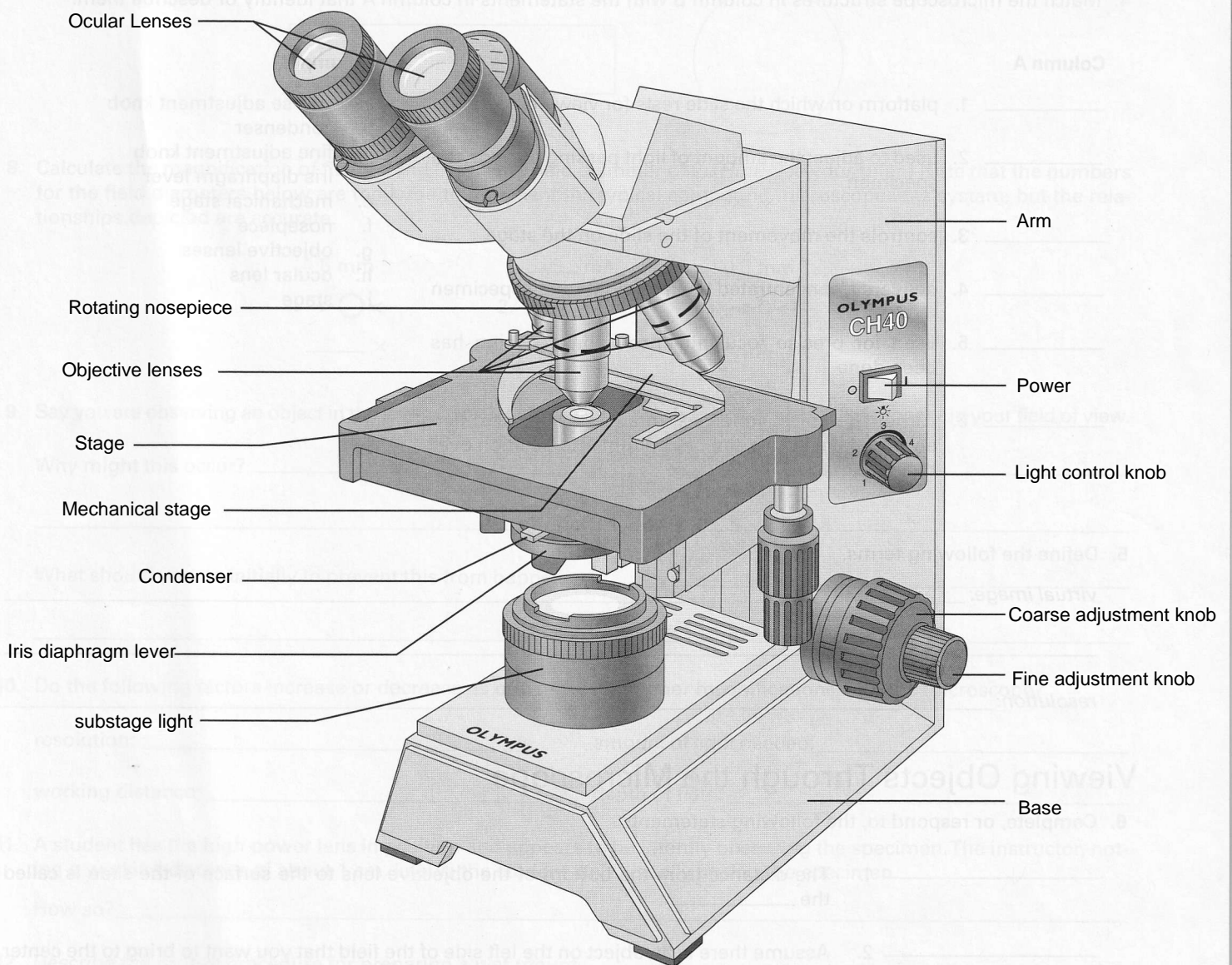
# REVIEW SHEET

## The Microscope

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### Care and Structure of the Compound Microscope

1. Label all indicated parts of the microscope.



2. Explain the proper technique for transporting the microscope.

The microscope sits upright, with one hand on the arm and the other on the base.

3. The following statements are 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.

- lens paper \_\_\_\_\_ 1. The microscope lens may be cleaned with any soft tissue.
- lowest power lens \_\_\_\_\_ 2. The microscope should be stored with the oil immersion lens in position over the stage.
- T \_\_\_\_\_ 3. When beginning to focus, use the lowest-power lens.
- Fine \_\_\_\_\_ 4. When focusing on high power, always use the coarse adjustment knob to focus.
- T \_\_\_\_\_ 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**

- i \_\_\_\_\_ 1. platform on which the slide rests for viewing
- d \_\_\_\_\_ 2. used to adjust the amount of light passing through the specimen
- e \_\_\_\_\_ 3. controls the movement of the slide on the stage
- b \_\_\_\_\_ 4. delivers a concentrated beam of light to the specimen
- c \_\_\_\_\_ 5. used for precise focusing once initial focusing has been done
- f \_\_\_\_\_ 6. carries the objective lenses; rotates so that the different objective lenses can be brought into position over the specimen

**Column B**

- a. coarse adjustment knob
- b. condenser
- c. fine adjustment knob
- d. iris diaphragm lever
- e. mechanical stage
- f. nosepiece
- g. objective lenses
- h. ocular lens
- i. stage

5. Define the following terms.

*virtual image*: The image that your eyes see after being produced by the ocular lens.

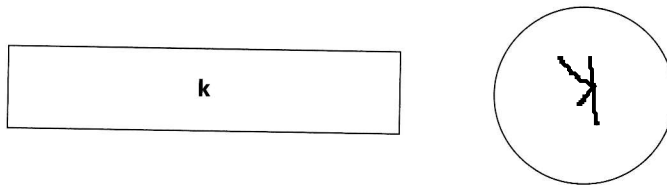
*resolution*: The ability to discriminate two close objects as separate.

## Viewing Objects Through the Microscope

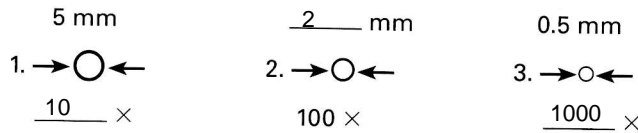
6. Complete, or respond to, the following statements:

- 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 of view \_\_\_\_\_ 3. The area of the slide seen when looking through the microscope is the \_\_\_\_\_.
- 95x \_\_\_\_\_ 4. If a microscope has a 10× ocular lens and the total magnification at a particular time is 950×, the objective lens in use at that time is \_\_\_\_\_ ×.

- to provide more 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 \_\_\_\_\_.
- .75mm 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.
- .4mm 8. If the diameter of the high-power field is 1.2 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 *k* on it (as shown below). In the circle below, draw the *k* as seen in the low-power field.



8. Calculate the magnification of fields 1 and 3, and the field diameter of 2. (*Hint: Use your ruler.*) Note that the numbers for the field diameters below are too large to represent the typical compound microscope lens system, but the relationships depicted are accurate.



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 object could be uncentered in the low-power field, causing it to disappear when the field of view is narrowed.

What should you do initially to prevent this from happening? \_\_\_\_\_

Make sure the object is centered when focusing in low power

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

resolution: Increases 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 high-power field of view is much smaller than 1cm, meaning the student does not have the specimen in focus.

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

1. get the proper equipment ready; cleanslides and covers, a dropper of saline, a dropper of staining solution, filter paper, and flat-tipped toothpicks.

2. place a drop of saline in the center of the slide, followed by the specimen. Then add the staining solution to the specimen.

3. At an angle add the cover slip, do not drop the slip, and proceed to examine under the microscope.

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

a. Only half of the field is illuminated: Something must be blocking the light from getting to the objective lens.

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

The stage could be so far away that the field of view appears to not change.



0.8 mm

mm

mm



### Viewing Objects Through the Microscope

11. A student has the high-power lens in position and appears to be intently observing the specimen. The instructor notices a working distance of about 1 mm. What is wrong?

How do you know?

12. Describe the proper procedure for preparing a wet mount. Draw or label the drawing.

13. The area of the slide seen when looking through the microscope is \_\_\_\_\_

14. A student has a microscope with a 10X ocular lens and a 40X objective lens. What is the total magnification?