

Name Ester Tavares

Lab Time/Date 2/28/2021

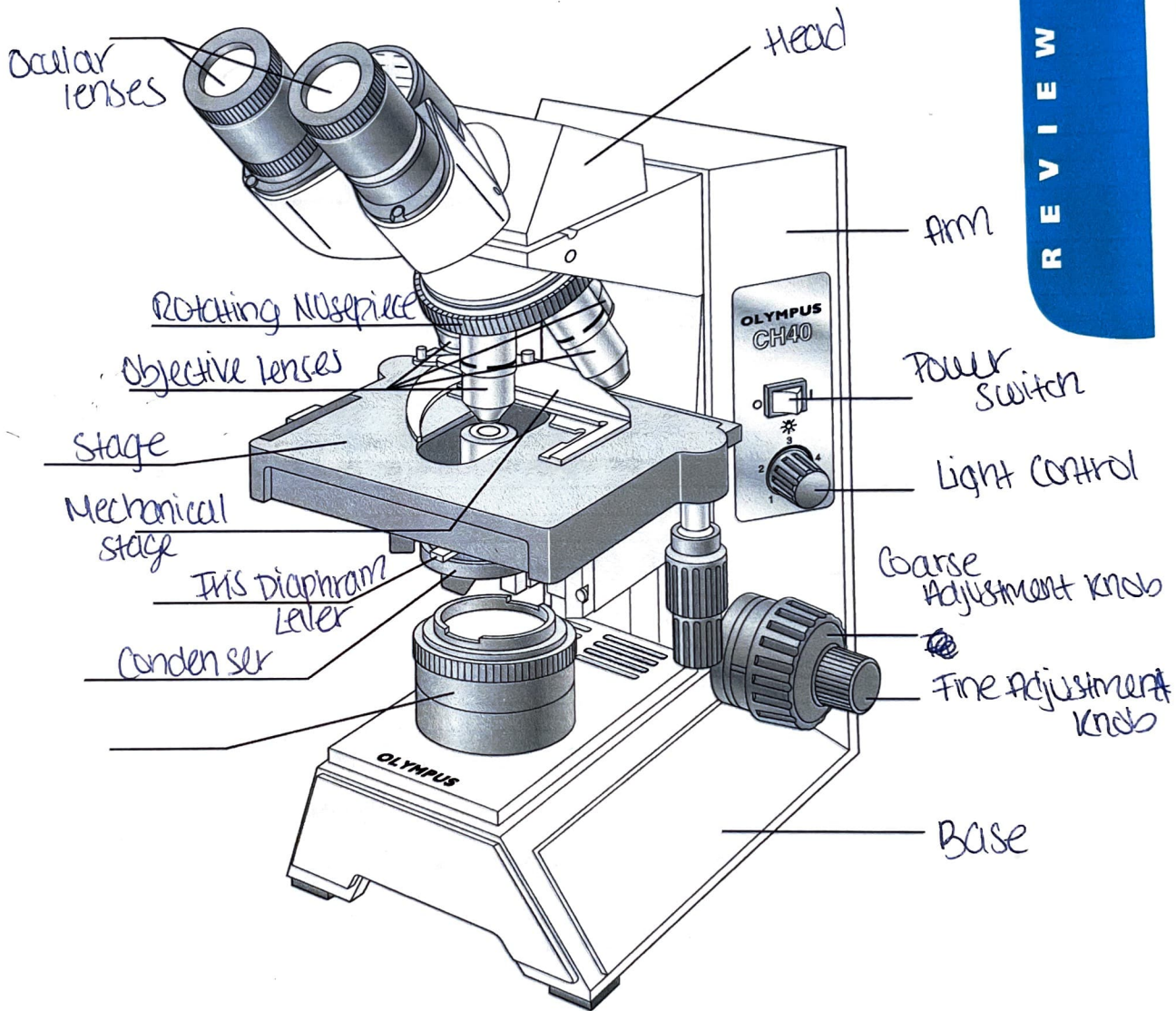
EXERCISE 3

REVIEW SHEET

The Microscope

Care and Structure of the Compound Microscope

1. Label all indicated parts of the microscope.



2. Explain the proper technique for transporting the microscope.

carry with 2 hands, 1 under the base, 1 holding the arm

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.

- W. Grit free lens paper 1. The microscope lens may be cleaned with any soft tissue.
Low Powder 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.
Away From 4. When focusing, always focus toward the specimen.
T 5. A coverslip should always be used with wet mounts and the high-power and oil lenses.

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 increase the amount of light passing through the specimen
E 3. secure(s) the slide to 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
 e. mechanical stage
 f. nosepiece
 g. objective lenses
 h. ocular
 i. spring clips
 j. stage

5. Define the following terms.

virtual image: A image that appears to be where it's not

resolution: Ability to discriminate 2 close objects as separate

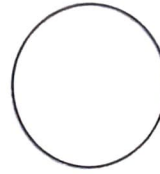
Viewing Objects Through the Microscope

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

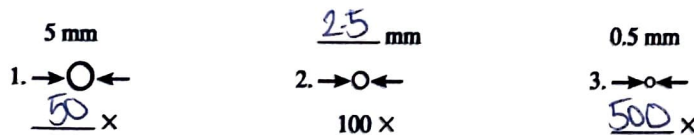
- Working Distance 1. The distance from the bottom of the objective lens to the specimen is called the _____
To the left 2. Assume there is an object on the left side of the field that you want to bring to the center (that is, toward the apparent right). In what direction would you move your slide? _____
Field 3. The area of the specimen seen when looking through the microscope is the _____
d5 4. If a microscope has a 10× ocular and the total magnification at a particular time 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, only the fine adjustment need be used to focus the specimen at the higher powers, the microscope is said to be _____
~~0.75~~ 7. If, when using a 10× ocular and a 15× objective, the field size is 1.5 mm, the approximate field size with a 30× objective is _____ mm.

0.4 8. If the size 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. Figure out the magnification of fields 1 and 3, and the field size of 2. (*Hint: Use your ruler.*) Note that the numbers for the field sizes 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? Unless the power is centered at low power, it might be outside the higher-power field

What should be done initially to prevent this from happening? Center the object that you wish to view

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

resolution: Increase

amount of light needed: Increase

working distance: Decrease

depth of field: Decrease

11. A student has the high-dry 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 H.P. lens is closer to 1mm.

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

1) Place specimen on the slide w. a medicine dropper. 2) Mix specimen into drop with a toothpick. 3) If it's staining, add a drop of stain & mix w. a toothpick. 4) Hold a coverslip w. forceps so that 1 side touches the specimen drop, & then slowly put down the other side of the coverslip.

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

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

b. Field does not change as mechanical stage is moved: The slide wasn't put correctly in the clamp on the stage & does not move when the mechanical stage moves.

Name Ester Tavares

Lab Time/Date 2/28/2021

EXERCISE **4**

REVIEW SHEET

The Cell: Anatomy and Division

Anatomy of the Composite Cell

1. Define the following terms:

organelle: A specialized part of the cell that has a specific function

cell: Basic building blocks of all living things

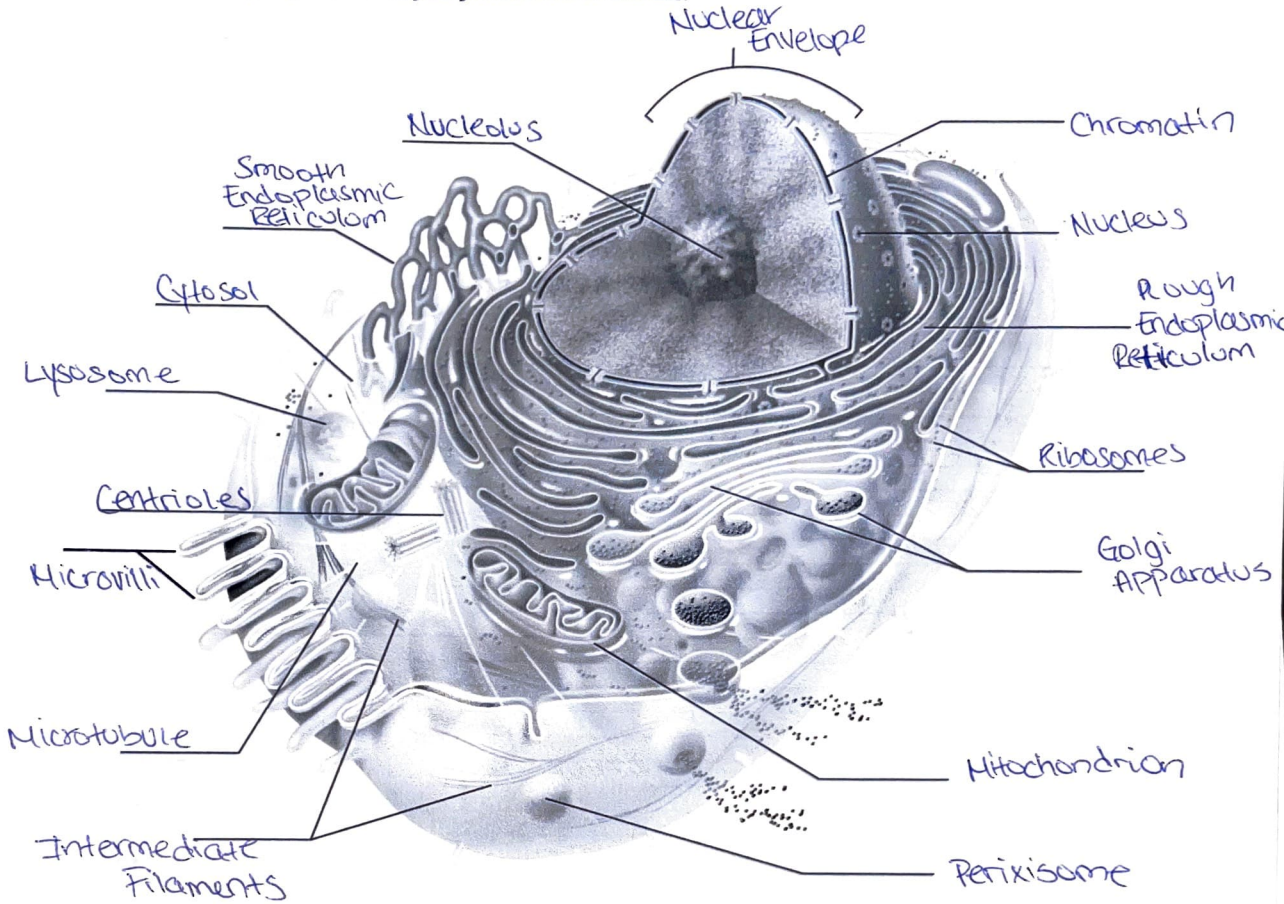
2. Although cells have differences that reflect their specific functions in the body, what functions do they have in common?

All cells grow, reproduce, metabolize, move, & respond to stimuli

3. Identify the following cell parts:

- | | |
|--------------------------|--|
| <u>Plasma Membrane</u> | 1. external boundary of cell; regulates flow of materials into and out of the cell; site of cell signaling |
| <u>Lysosome</u> | 2. contains digestive enzymes of many varieties; "suicide sac" of the cell |
| <u>Mitochondria</u> | 3. scattered throughout the cell; major site of ATP synthesis |
| <u>Microvilli</u> | 4. slender extensions of the plasma membrane that increase its surface area |
| <u>Inclusions</u> | 5. stored glycogen granules, crystals, pigments, and so on |
| <u>Golgi Apparatus</u> | 6. membranous system consisting of flattened sacs and vesicles; packages proteins for export |
| <u>Nucleus</u> | 7. control center of the cell; necessary for cell division and cell life |
| <u>Centrioles</u> | 8. two rod-shaped bodies near the nucleus; associated with the formation of the mitotic spindle |
| <u>Nucleolus</u> | 9. dense, darkly staining nuclear body; packaging site for ribosomes |
| <u>Microfilaments</u> | 10. contractile elements of the cytoskeleton |
| <u>Rough ER</u> | 11. membranous system; involved in intracellular transport of proteins and synthesis of membrane lipids |
| <u>Ribosomes</u> | 12. attached to membrane systems or scattered in the cytoplasm; site of protein synthesis |
| <u>Chromatin Threads</u> | 13. threadlike structures in the nucleus; contain genetic material (DNA) |
| <u>Peroxisome</u> | 14. site of free radical detoxification |

4. In the following diagram, label all parts provided with a leader line.



Differences and Similarities in Cell Structure

5. For each of the following cell types, list (a) *one* important structural characteristic observed in the laboratory, and (b) the function that the structure complements or ensures.

- | | |
|---------------------|--|
| squamous epithelium | a. Cells fit closely together |
| | b. A lining tissue |
| sperm | a. Has a tail |
| | b. Tail allows sperm to move itself to an egg |
| smooth muscle | a. Cells have an elongated shape |
| | b. A long axis allows a greater degree of shortening |
| red blood cells | a. Donut/Disc shaped |
| | b. A lot of space to carry hemoglobin |

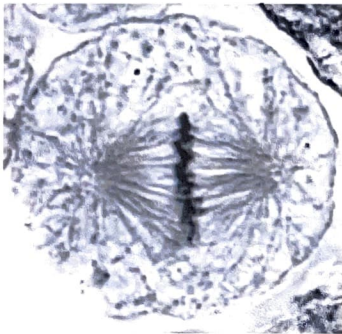
6. What is the significance of the red blood cell being anucleate (without a nucleus)? without a nucleus,
the cell can't produce new proteins, etc.

Did it ever have a nucleus? (Use an appropriate reference.) Yes If so, when? Before released into bloodstream

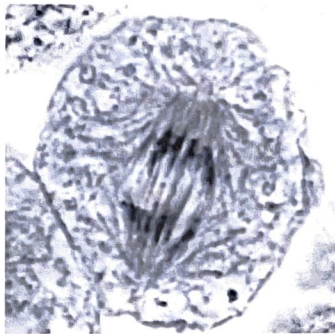
7. Of the four cells observed microscopically (squamous epithelial cells, red blood cells, smooth muscle cells, and sperm),
 which has the smallest diameter? _____ Which is longest? _____

Cell Division: Mitosis and Cytokinesis

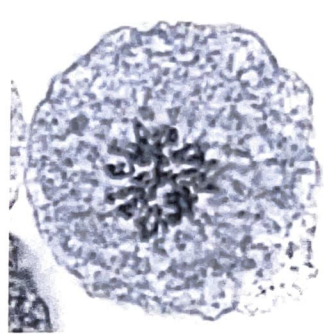
8. Identify the three phases of mitosis in the following photomicrographs.



a. Metaphase



b. Anaphase



c. Prophase

9. What is the importance of mitotic cell division? Provides cells for the repair of damaged
cells/tissues & growth.

10. Draw the phases of mitosis for a cell that contains four chromosomes as its diploid or $2n$ number.