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

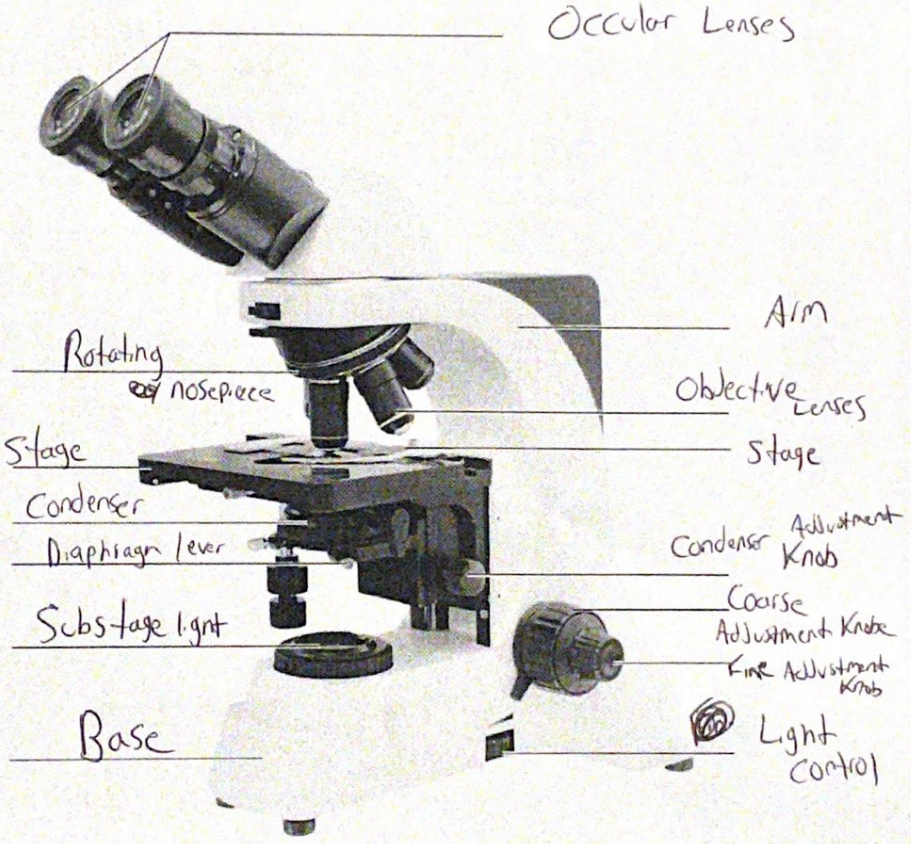
REVIEW SHEET

EXERCISE 3 **The Microscope**

Name Jose Haley Lab Time/Date 3-2-2021

Care and Structure of the Compound Microscope

1. Label all indicated parts of the microscope.



2. Explain the proper technique for transporting the microscope.

Hold in upright position with one hand and support the base. Make sure lenses is clean.

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.

Special Grit Lens Paper 1. The microscope lens may be cleaned with any soft tissue.

Scanning Objective 2. The microscope should be stored with the oil immersion lens in position over the stage.

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

T 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

B 2. used to adjust the amount of light passing through the specimen

E 3. controls the movement of the slide on the stage

D 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 specimens.

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.

total magnification: the product of the occular lens and objective lens magnification

resolution: to distinguish two objects from each other

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 _____.

right 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 _____ ×.

To have 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 _____.

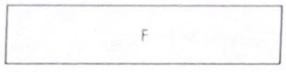
.75mm

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.

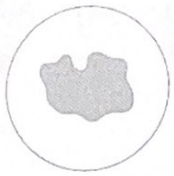
1.5

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 = 16 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 object will be out of focus and not work properly

What should you do initially to prevent this from happening? All focus the object before going to hgher Lens

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-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 lenses are on shorter Working Distance,

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

Place a drop of saline on a clean slide using a medicine dropper

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

a. Only half of the field is illuminated: Lens is not rotated in place

b. The visible field does not change as the mechanical stage is moved: This can be a problem with the lenses

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.

Because only high magnification and resolution to be able to see within cells

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? Makes the tissues transparent and makes it easer to observe internal structure

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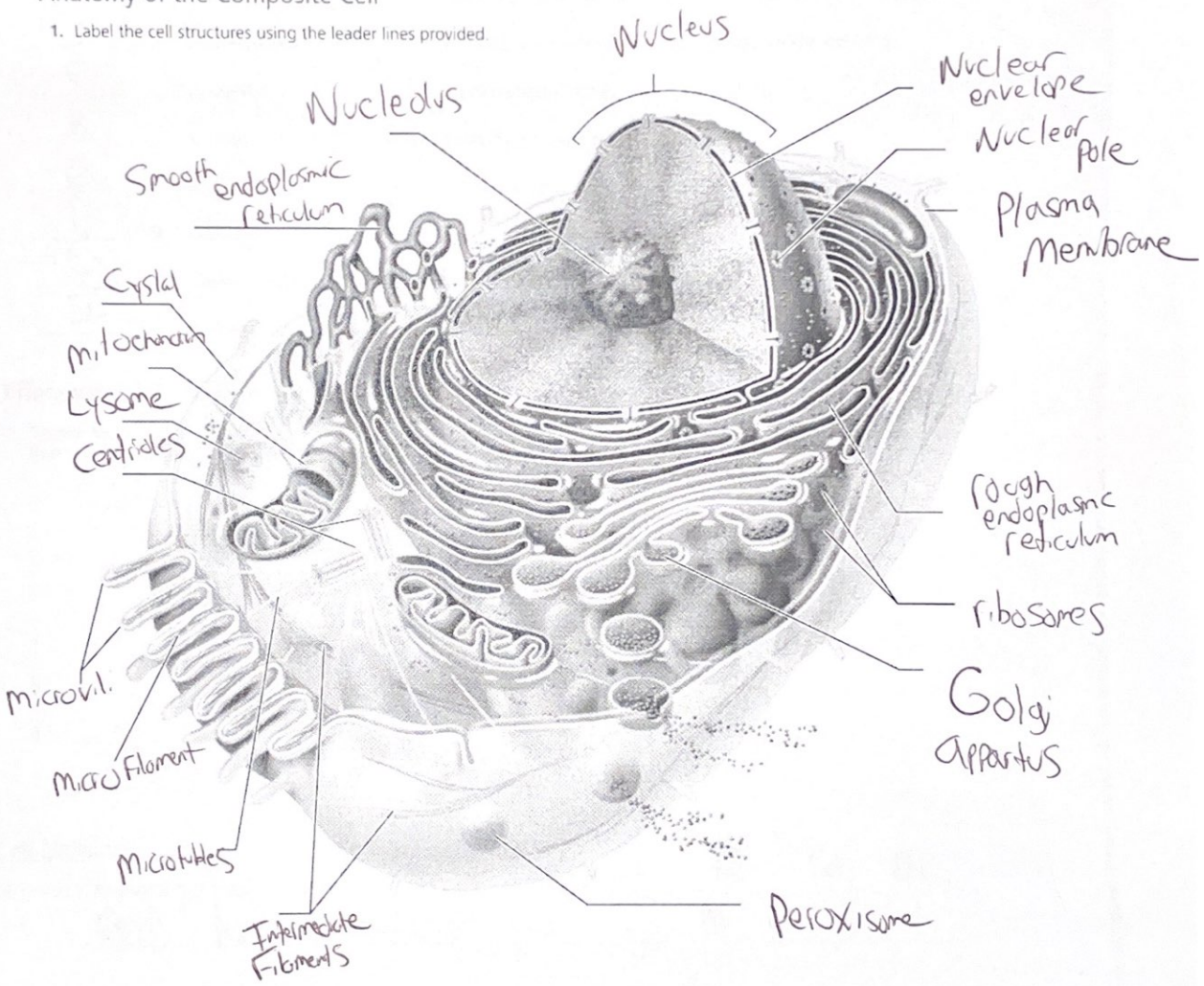
EXERCISE 4 REVIEW SHEET

The Cell: Anatomy and Division

Name Jose Haley Lab Time/Date 3-2-2021

Anatomy of the Composite Cell

1. Label the cell structures using the leader lines provided.



2. Match each cell structure listed on the left with the correct description on the right.

F	1. ribosome	a.	main site of ATP synthesis
H	2. smooth ER	b.	encloses the chromatin
A	3. mitochondrion	c.	sac of digestive enzymes
B	4. nucleus	d.	examples include glycogen granules and ingested foreign materials
J	5. Golgi apparatus	e.	forms basal bodies and helps direct mitotic spindle formation
C	6. lysosome	f.	site of protein synthesis
K	7. centriole	g.	forms the external boundary of the cell
e	8. cytoskeleton	h.	site of lipid synthesis
D	9. inclusion	i.	packaging site for ribosomes
G	10. plasma membrane	j.	packages proteins for transportation
I	11. nucleolus	k.	internal cellular network of rodlike structures

Differences and Similarities in Cell Structure

3. Choose the specimen observed in Activity 5 (squamous epithelium, sperm cells, smooth muscle, or human red blood cells) that fits the description below.

1. Sperm cell has a flagellum for movement
2. Smooth cells have an elongated shape (tapered at each end)
3. Squamous cells are close together
4. red blood cells are circular
5. Squamous cells are thin and flat, with irregular borders
6. red blod cells cells are anucleate (without a nucleus)
7. Smooth muscle longest cell

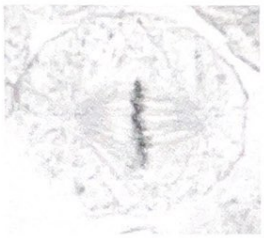
Cell Division

4. What is the function of mitotic cell division? it is needed for the Cell to reproduce and grow

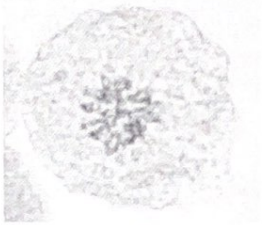
5. Identify the four phases of mitosis shown in the following photomicrographs, and select the events from the key that correctly identify each phase. On the appropriate answer line, write the letters that correspond to these events.

Key:

a. The nuclear envelope re-forms.
b. Chromosomes line up in the center of the cell.
c. Chromatin coils and condenses, forming chromosomes.
d. Chromosomes stop moving toward the poles.
e. The chromosomes are V shaped.
f. The nuclear envelope breaks down.
g. Chromosomes attach to the spindle fibers.
h. The mitotic spindle begins to form.

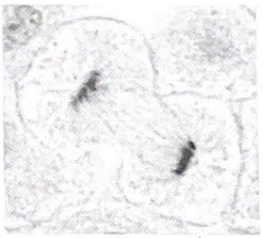


1. Phase: Metaphase
   Events: b, F



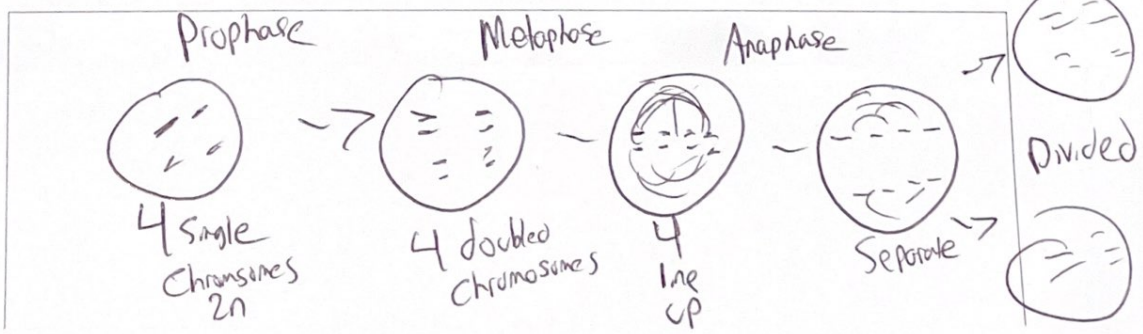
2. Phase: Prophase
   Events: G, H

3. Phase: Anaphase
   Events: e



4. Phase: Telophase
   Events: A, D

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



7. Describe the events that occur during interphase.

The cell carries out its normal metabolic Activities and it grows

8. Complete or respond to the following statements:

Division of the __1__ is referred to as mitosis. Cytokinesis is division of the __2__. The major structural difference between chromatin and chromosomes is that the latter are __3__. Chromosomes attach to the spindle fibers by undivided structures called __4__. If a cell undergoes mitosis but not cytokinesis, the product is __5__. The structure that acts as a scaffolding for chromosomal attachment and movement is called the __6__. __7__ is the period of cell life when the cell is not involved in division. Three cell populations in the body that do not routinely undergo cell division are __8__, __9__, and __10__.

1. Nucleus
2. Cytoplasm
3. Condensed
4. Centromeres
5. Binucleate Cell
6. Spindle
7. Interphase
8. Skeletal Muscle
9. Cardiac Muscle
10. Neurons

9. Plasma cells are key to the immune response because they secrete antibodies. Given that antibodies are made of protein, which membrane-enclosed cell organelle would you expect the plasma cells to have in abundance? Why? Ribosomes because they are abundant and they synthesis proteins

10. Name which organelle you would expect to play the largest role in decomposition of the human body. Why? Lysomes they degrade

11. Some antifungal medications work by blocking DNA synthesis in the fungal cell. Describe where in the cell cycle such a medication would halt the fungal cell and the consequences of this early termination of the cycle. Interphase Which is responsible for DNA