



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

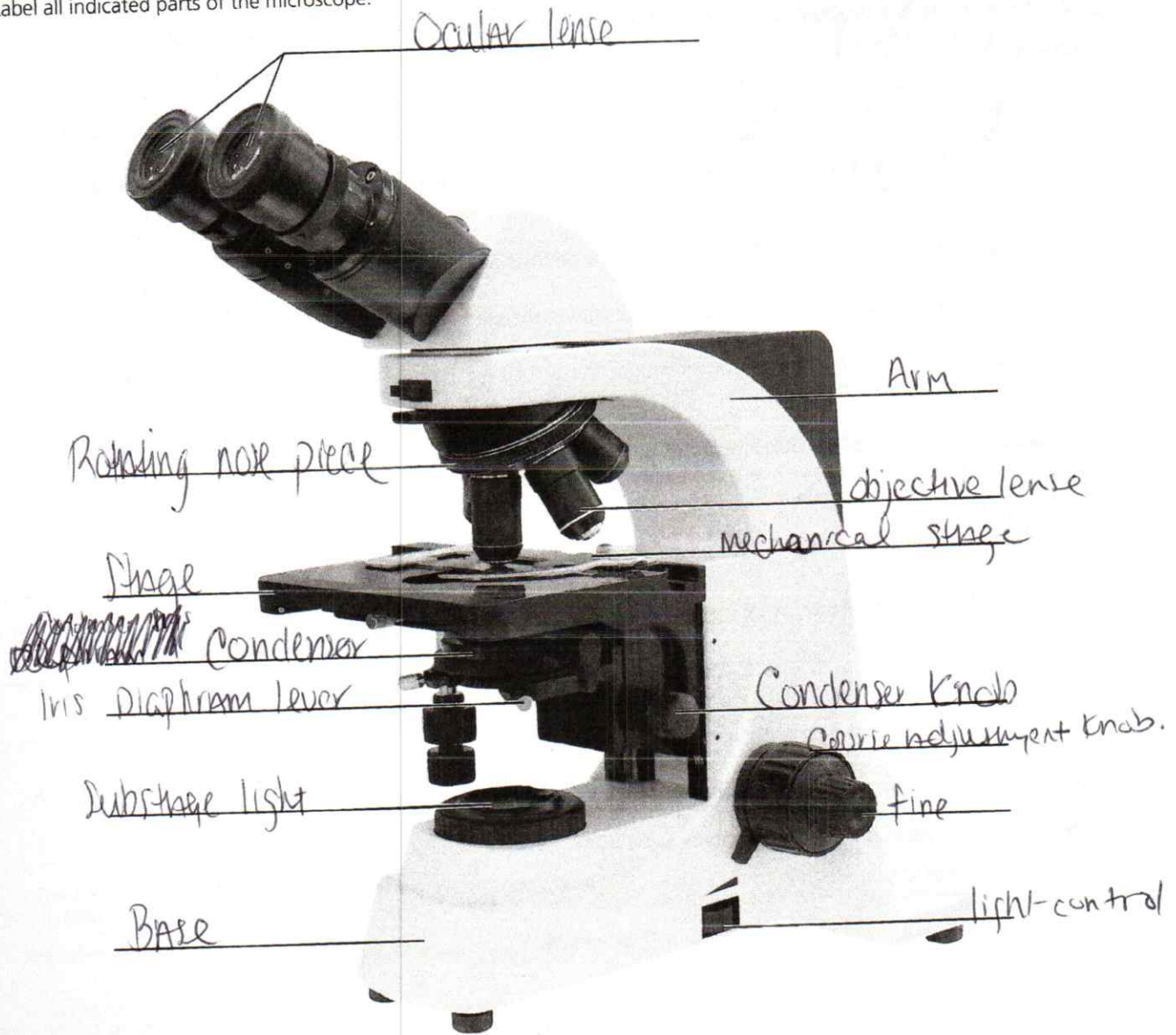
# 3 EXERCISE REVIEW SHEET

## The Microscope

Name Chelsea Andersen 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.

When transporting microscope, it need to be held in a upright position. One hand on the arm, and the other hand supporting its base.

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.

- F - need to be clean w/ special lens paper 1. The microscope lens may be cleaned with any soft tissue.
- T 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
- C 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 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.

total magnification: ~~total magnification equals objective magnification x ocular mag.~~

total magnification equals objective magnification x ocular mag. 10x objective  
 10x ocular - the image that is viewed will be 100 times times its actual size.

resolution: observes distinguished detail.

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

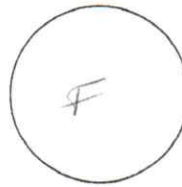
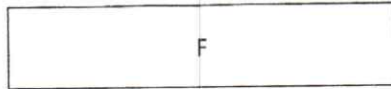
*It will give a contrasting view of the cells.*

*par focal*

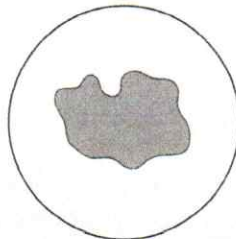
*1.75 mm*

*1.5 mm*

5. Why should the light be dimmed when looking at living (nearly transparent) cells?
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 \_\_\_\_\_.
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.
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  $\mu\text{m}$ :



Total magnification = 100×

Field diameter = 1.6 mm

Length of object = *1/6*  $\mu\text{m}$

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? *This will blur the object. It will not be focused until the light is adjusted + ensure that it is centered.*

What should you do initially to prevent this from happening? *Ensure that it is centered + ~~focus~~ adjust the ~~focus~~ focus of the object*

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 student is not seeing the specimen because high powered lenses are used for shorter working distances less than 1cm*

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

To prepare a wet mount a drop of saline need to be place on the center of a slide. following, the object must be placed. The cover slip must be held at a  $45^\circ$  angle & lowered onto the slide slowly.

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

a. Only half of the field is illuminated: This happens when a light field becomes blocked

b. The visible field does not change as the mechanical stage is moved: This could happen when the lense is not adjusted properly.

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.

Structures inside a cell including protozoa are small & can not be seen with a low magnification.

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? Thin slices are used because thicker tissue are more difficult to stain. Thin slices are used to see more clearly.



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# 4

EXERCISE

## REVIEW SHEET

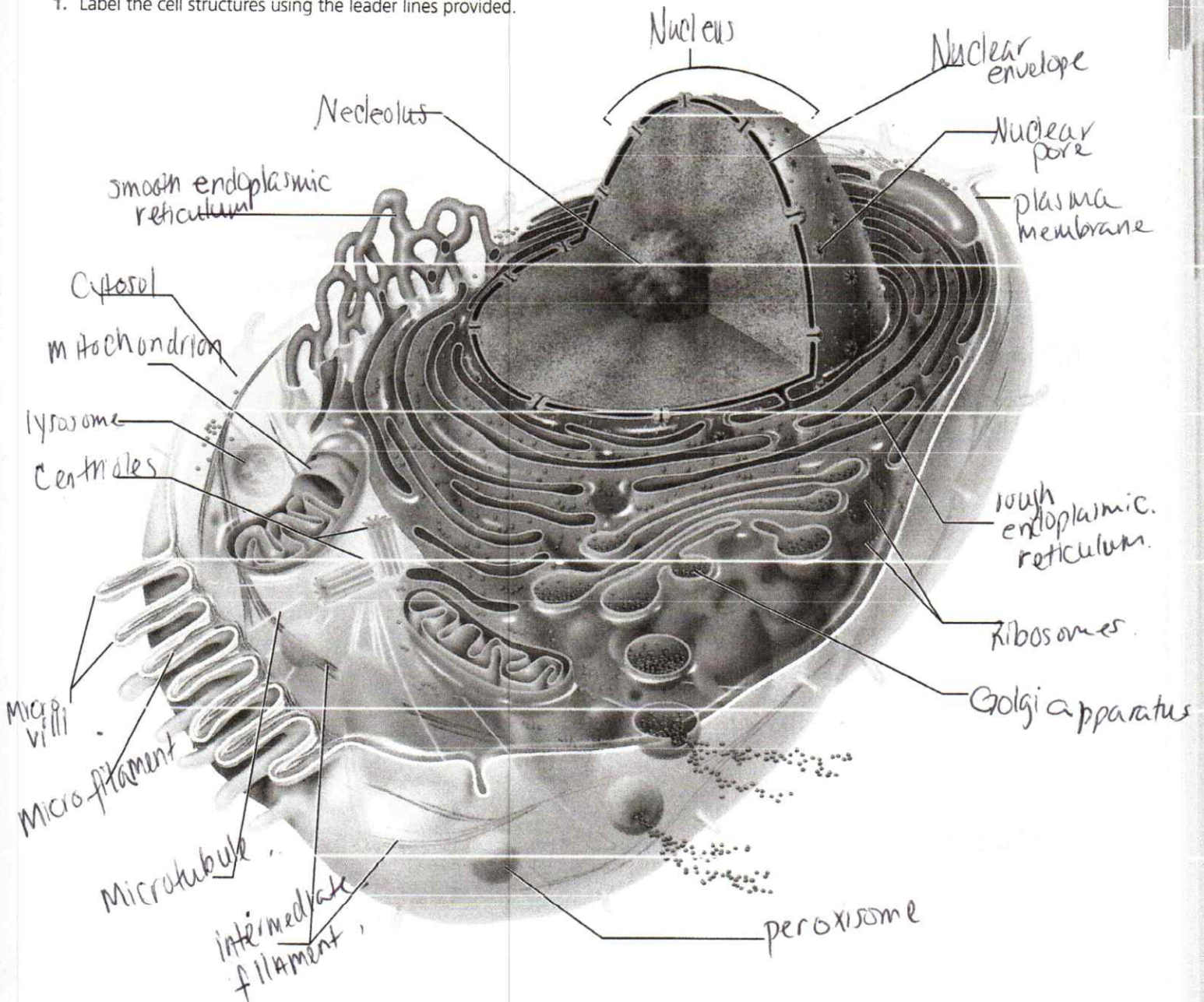
# The Cell: Anatomy and Division

Name Chelsea Andersen

Lab Time/Date \_\_\_\_\_

### 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  
H 2. smooth ER  
A 3. mitochondrion  
B 4. nucleus  
J 5. Golgi apparatus  
C 6. lysosome  
E 7. centriole  
E 8. cytoskeleton  
D 9. inclusion  
G 10. plasma membrane  
I 11. nucleolus

- a. main site of ATP synthesis  
b. encloses the chromatin  
c. sac of digestive enzymes  
d. examples include glycogen granules and ingested foreign materials  
e. forms basal bodies and helps direct mitotic spindle formation  
f. site of protein synthesis  
g. forms the external boundary of the cell  
h. site of lipid synthesis  
i. packaging site for ribosomes  
j. packages proteins for transportation  
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 epithelium cells are close together  
4. RBC cells are circular  
5. squamous cells are thin and flat, with irregular borders  
6. RBC cells are anucleate (without a nucleus)  
7. smooth muscle longest cell

### Cell Division

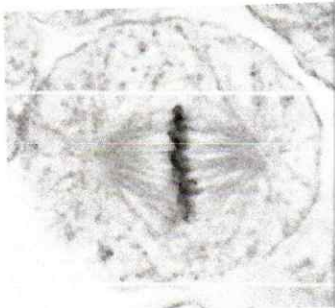
4. What is the function of mitotic cell division? Mitotic cell division functions for

growth, repair of cells and asexual reproduction for  
single cell organisms

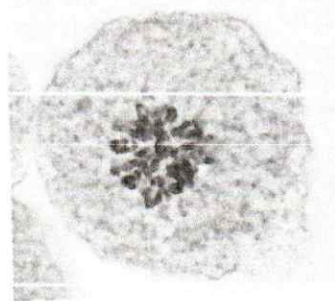
5. Identify the four phases of mitosis shown in the following photomicrographs, and select the events from the key that correctly identify each phase. On the appropriate answer line, write the letters that correspond to these events.

Key:

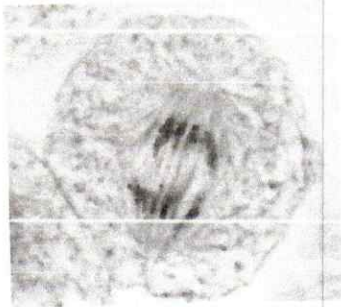
- a. The nuclear envelope re-forms.
- b. Chromosomes line up in the center of the cell.
- c. Chromatin coils and condenses, forming chromosomes.
- d. Chromosomes stop moving toward the poles.
- e. The chromosomes are V shaped.
- f. The nuclear envelope breaks down.
- g. Chromosomes attach to the spindle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



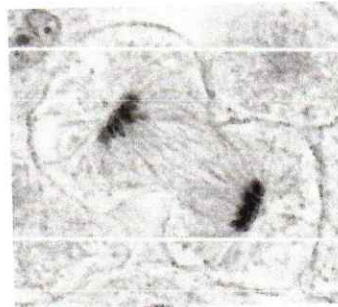
1. Phase: Metaphase  
 Events: B, F



2. Phase: prophase  
 Events: C, H

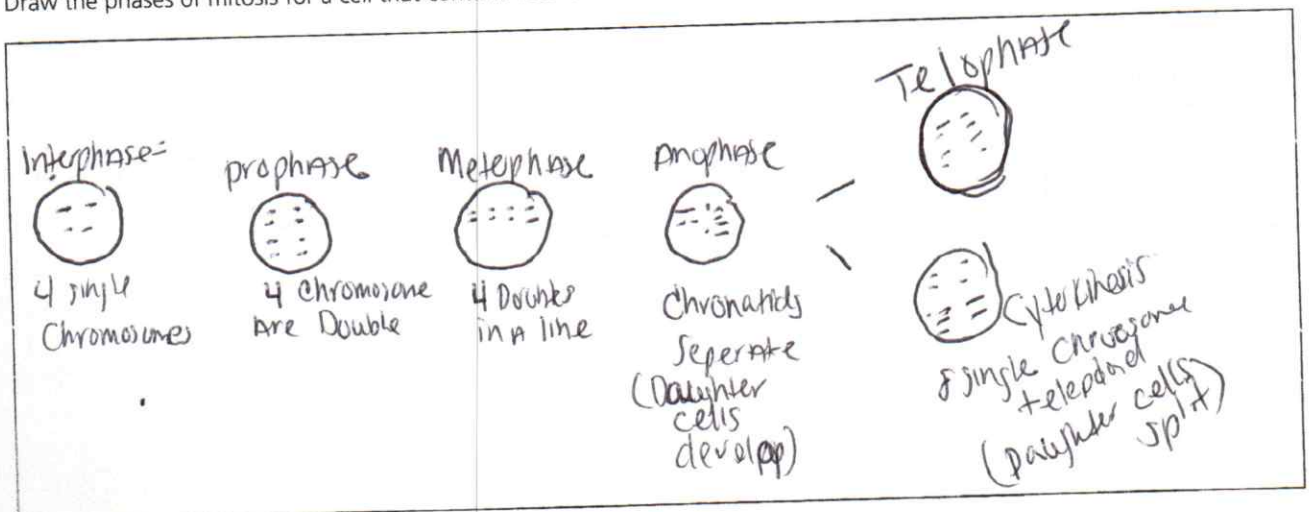


3. Phase: Anaphase  
 Events: E



4. Phase: Telophase  
 Events: A, D

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



7. Describe the events that occur during interphase.

During interphase the cell grows & makes a copy of its DNA

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.

- Nucleus
- Cytoplasm
- Condensed
- Centromeres
- ~~Binucleate cell~~ Binucleate cell
- Spindle
- Interphase
- Skeletal muscle
- Cardiac muscle
- ~~Neurons~~ 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? \_\_\_\_\_

Ribosome because they synthesize a large amount of protein

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

Lysozyme - it serves both to degrade & to digest obsolete components of the body

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 & Mitotic

phase. ~~Interphase~~ <sup>metabolic phase</sup> Interphase is where the DNA ~~rep~~ replication & protein synthesis take place. ~~mitotic phase~~