

3 EXERCISE

REVIEW SHEET

The Microscope

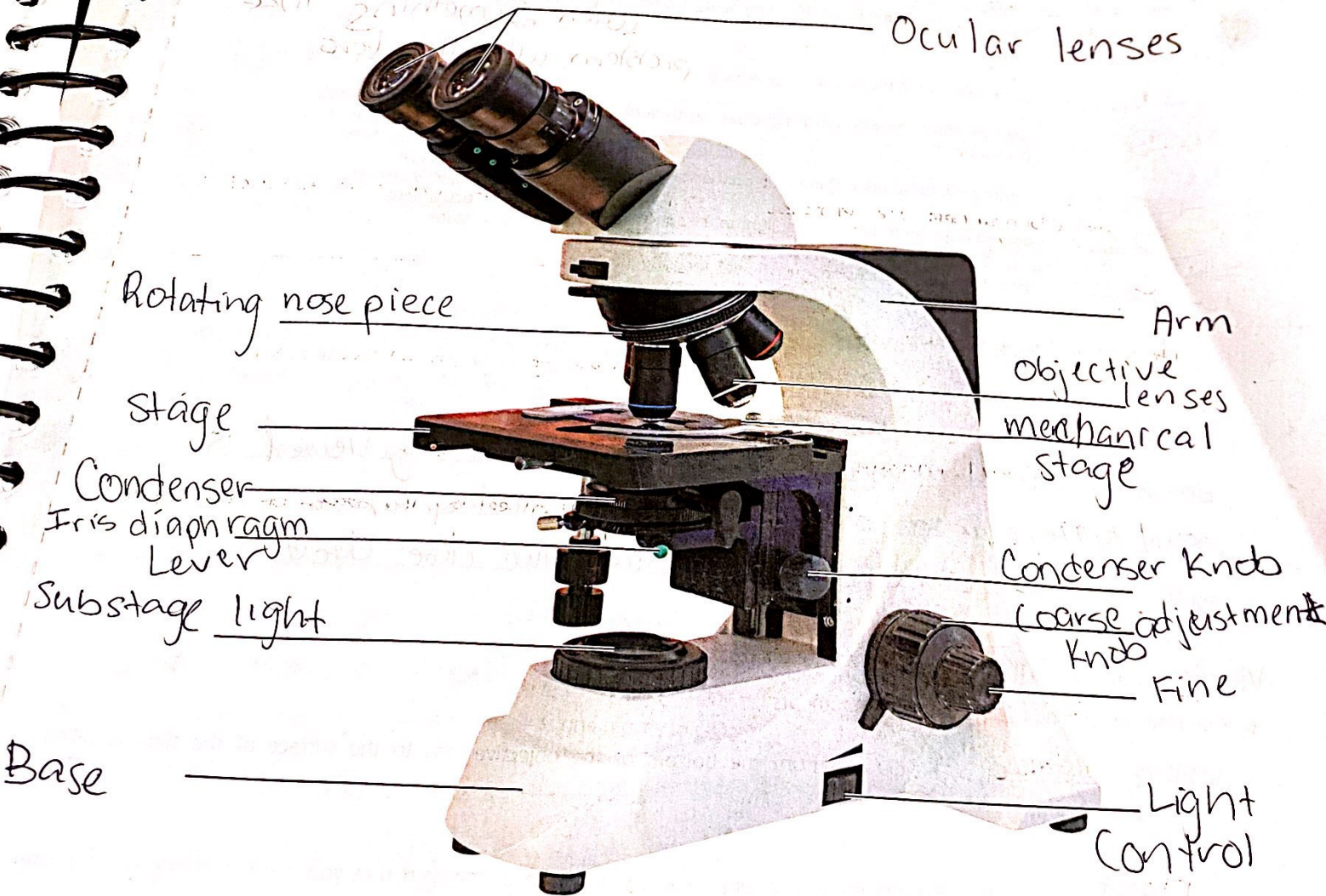
Instructors may assign a portion of the Review Sheet questions using **Mastering A&P**

Name Cherrina Campbell

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.

~~The microscope~~ should be held in a upright position with one hand on it's arm and the other supporting it's base. It should not be swung during it's transport or jar the instrument when setting it down.

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 anti-free lens paper

Scanning objective lens

T

T

T

1. The microscope lens may be cleaned with any soft tissue.
 2. The microscope should be stored with the oil immersion lens in position over the stage.
 3. When beginning to focus, use the scanning objective lens.
 4. When focusing on high power, always use the coarse adjustment knob to focus.
 5. A coverslip should always be used with wet mounts.
 6. 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

- 1 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
E 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 of any specimen being viewed is equal to the power of the ocular lens multiplied by the power of the objective lens.

resolution: is 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 working distance.

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? right.

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

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 95x.

To provide more contrast for viewing the cells

Parfocal 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 _____

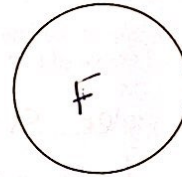
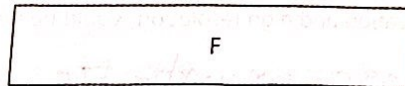
0.75 mm

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

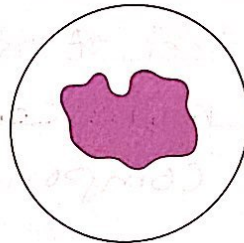
0.5 mm

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 μm :



Total magnification = 100 \times

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? Changing to a high power lens narrows the field view & the object will be out of focus, not centered.

What should you do initially to prevent this from happening? Before changing into a higher power lens we should focus 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

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? high-power lenses are used at shorter working distances than 1 cm.

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

Place a drop of saline in the center of a clean slide, After place the object. Hold the coverslip at a 45 degree angle with finger tips & lower it slowly.

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

a. Only half of the field is illuminated: The light path can be blocked by dust not illuminate the field completely.

b. The visible field does not change as the mechanical stage is moved: when something like this happens it can be a problem with the lens.

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.

Cause only under a microscope with the appropriate lenses can be distinguished the protozoa which is found on the red blood 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? Thin slices of tissues are ideal cause it can allow that on the microscope can be seen.

The tissue & its components more clearly.

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EXERCISE

REVIEW SHEET

The Cell: Anatomy and Division

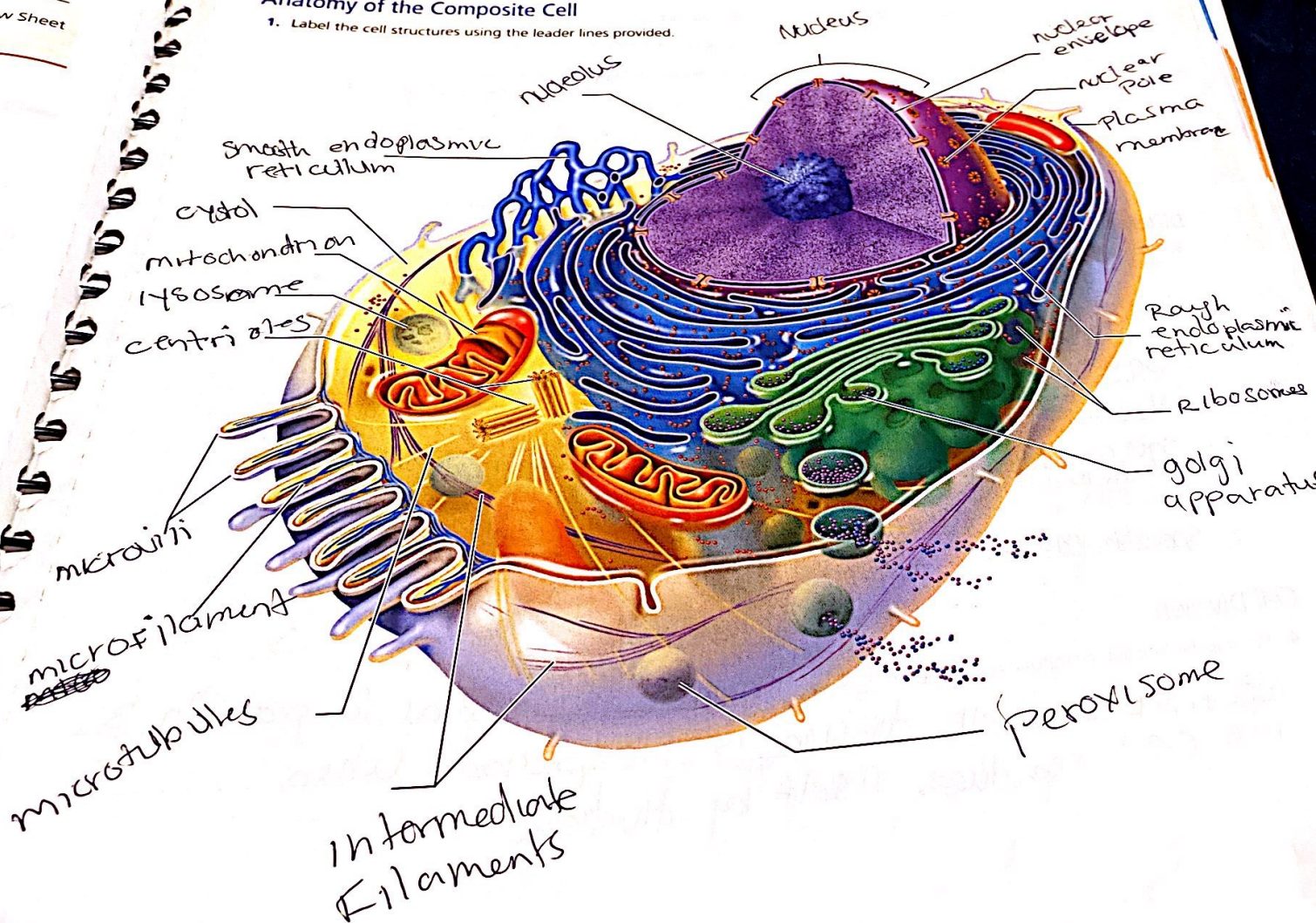
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Anatomy of the Composite Cell

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



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, K 7. centriole
- e 8. cytoskeleton
- D 9. inclusion
- G 10. plasma membrane
- P 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.

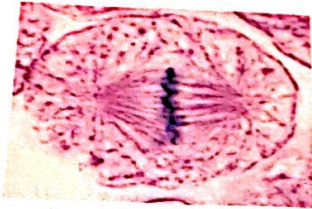
- 1. Sperm cell has a flagellum for movement
- 2. Smooth cells have an elongated shape (tapered at each end)
- 3. Squamous epithelium cells are close together
- 4. Human red blood cells are circular
- 5. Squamous cells are thin and flat, with irregular borders
- 6. Human red blood cells cells are anucleate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

Cell Division

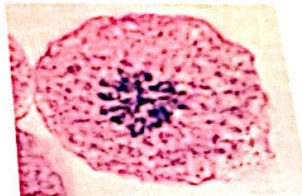
4. What is the function of mitotic cell division? cell division is essential for growth & repair. mitotic cell division is the period when the cell reproduces itself by dividing.

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.



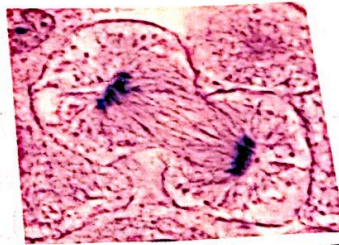
1. Phase: metaphase
Events: b, f



2. Phase: prophase
Events: c, h

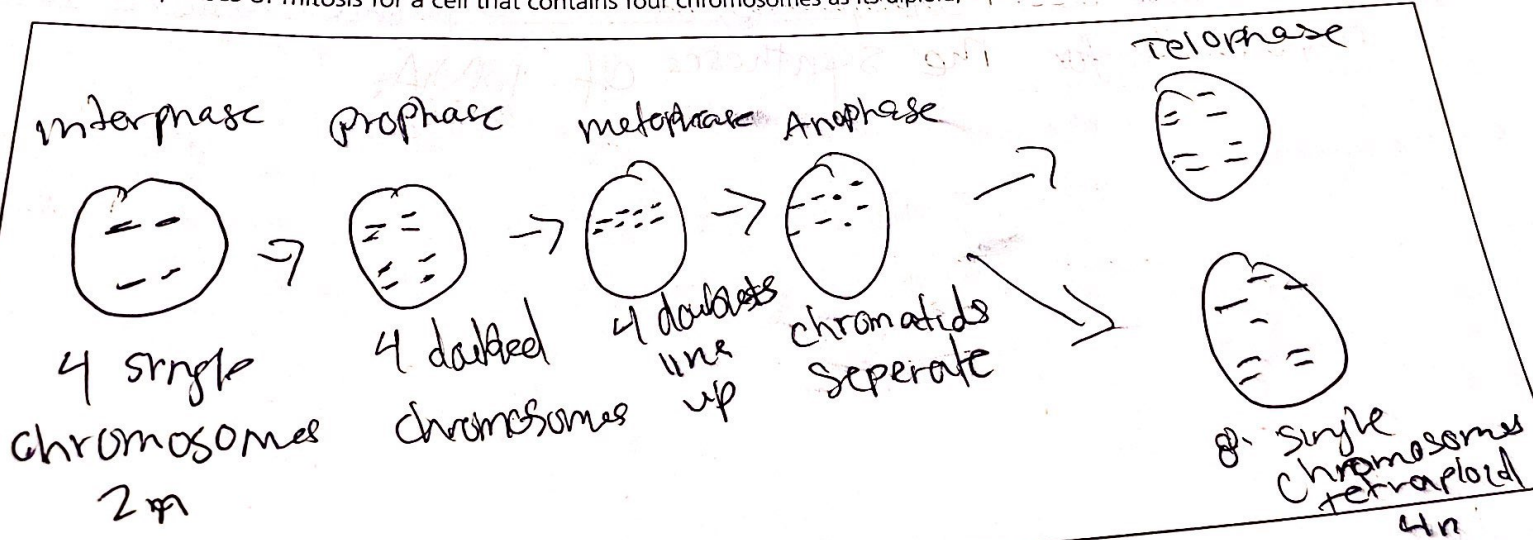


3. Phase: Anaphase
Events: e



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.

interphase is the period when the cell carries out its metabolic activities & grows. The DNA containing material is in the form of chromatin. The nuclear envelope & one or more nucleoli are intact & visible.

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

cause they are particularly abundant in cells that synthesize large amounts of protein

10. + Name which organelle you would expect to play the largest role in decomposition of the human body. Why? Lysosomes, cause 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.

This may occur interphase, in the S phase which is responsible for the synthesis of DNA.