

Name:

Mitosis and the Onion Root

Purpose: *(How does completing this lab further your understanding of the subject matter? Be specific):*

Procedure:

1. Get one microscope for your lab group and carry it to your lab desk with two hands. Make sure that the low power objective is in position and that the diaphragm is open to the widest setting.
2. Obtain a prepared slide of an onion root tip (there will be three root tips on a slide). Hold the slide up to the light to see the pointed ends of the root sections. This is the root tip where the cells were actively dividing. (The root tips were freshly sliced into thin sections, then preserved when the slide was prepared.)
3. Place the slide on the microscope stage with the root tips pointing away from you. Using the low-power objective to find a root tip; and focus it with the coarse adjustment until it is clearly visible. Just above the root "cap" is a region that contains many new small cells. The larger cells of this region were in the process of dividing when the slide was made. These are the cells that you will be observing. Center the image, then switch to high power.
4. Observe the box-like cells that are arranged in rows. The chromosomes of the cells have been stained to make them easily visible. Select one cell whose chromosomes are clearly visible. (If you need to change the focus when using high power, remember to only use the fine adjust!)
5. Sketch this cell in the proper box below, labeling the stage of the cell cycle this cell is in. Make sure you draw what you see for the entire cell.
6. Now, find and draw 1 cell in each of the other 4 stages of the cell cycle (note: you do not need to look for or draw G1, S and G2; only interphase and the stages of mitosis). Please place these drawings in the correct order and label each stage. When you finish, answer the questions on the back of this sheet.

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Analysis & Conclusions:

1. What phase were the majority of the cells in?
2. Compare and contrast **chromatin** and **chromosomes**.
3. During which phases are the chromosomes visible (**as** chromosomes?)
4. What evidence shows that mitosis is a continuous process, not a series of separate events?
5. The onion plant began as a single cell. That cell had **X** number of chromosomes. (The exact number does not matter, we will just call that number "X".) How many chromosomes are in each of the cells that you observed? (Give the answer in terms of "X".) How do you know?
6. What is a centromere? (include its function)
7. Finally, list the stages of the cell cycle, and for each, provide a statement describing a significant event that takes place in the cell during this phase: