

Lab Instructor _____
Date _____

Name _____
Microscope # _____ Period _____

Objective: To study cells undergoing mitotic cell division

*****Use full sentences when answering all questions.*****

Background

To study mitosis you will examine groups of cells that have been preserved and then stained. Their nuclear structures are visible with the compound microscope. Some of the cells you will observe are at the very early stages of mitosis, some are at later stages, and others may be in interphase. Biologists have been able to trace, from slides such as these, the steps a cell goes through during mitotic division. It is very difficult to tell from slides just which stages come first and which come later. Keep this in mind as you try to reconstruct this process.

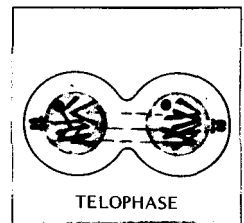
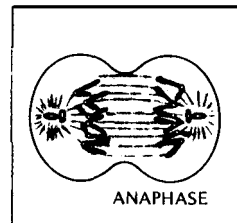
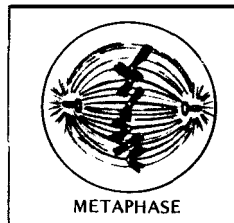
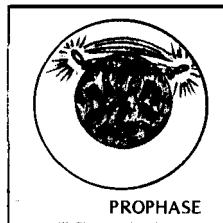
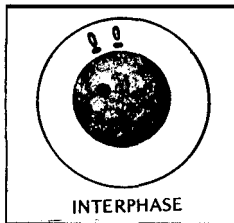
Pre-Lab

Read the entire lab description and appropriate text pages to answer the following questions.

1. How does the process of mitosis differ in an animal cell and in a plant cell?
2. How are apical meristems connected to the concept of mitosis?

LAB

Given:

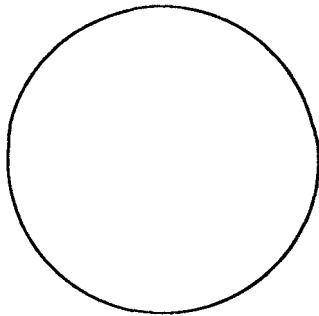


Materials

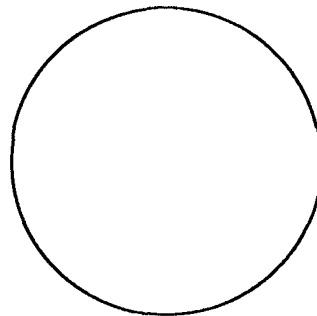
Compound light microscope, lens paper, prepared slides of onion root tip cells

Procedures and Observations

A. Draw and label what you observe under low and/or high power magnification as representative of mitosis.



Magnification ____X



Magnification ____X

TEACHER INITIALS

B. Using either copies of photos of cell samples or actual slide specimens you will investigate how much time is spent in the various stages of mitosis. Use the given pictures as a guide to count the number of cells in each phase. Focus on the onion root tip end as instructed. Calculate the percentage of cells in each phase of the cycle and write the amounts in Table 1. Follow the example of mathematical computations given in sample table.
(Assume % cells in a particular phase = % time spent in that phase)

SAMPLE TABLE

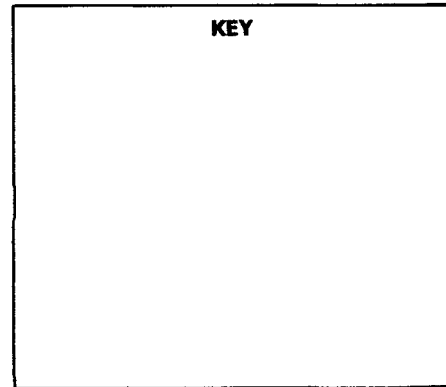
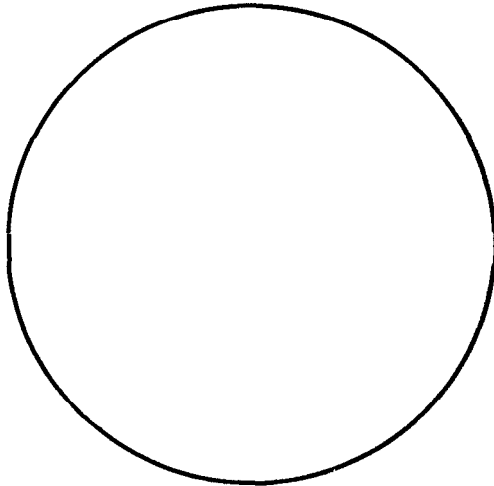
		INTERPHASE	PROPHASE	METAPHASE	ANAPHASE	TELOPHASE	TOTAL CELLS
Example:	# of cells	10	20	30	40	50	150
	% of cells	$\frac{10}{150} \times 100$					100

TABLE 1. Collected data of cells in various stages of mitosis

COUNTED BY		INTERPHASE	PROPHASE	METAPHASE	ANAPHASE	TELOPHASE	TOTAL CELLS
Individual/ Group	# of cells						
	% of cells						100
Class*	# of cells						
	% of cells						100

*Class data may be collated as time warrants.

C. Create a pie chart representing how much time is devoted to each phase of mitosis. (Use Individual/Group or Class data as instructed.) Label each section of the pie chart clearly. Construct a key with legend for classmates to follow.



Conclusions

- In which phase is the most time spent according to your data? How does this compare to the text information? Account for differences between your results, class results and text information.
- Why would it be beneficial to have a large sample size in this investigation?
- Describe what would occur in a human if the rate of mitotic stages were prolonged or too slow. Be specific.
- Why is reproduction at the cellular level an important life function? Give examples to support your response.