Mitosis Lab

Introduction
The growth of an organism is the irreversible increase in the number and size of cells. In other words, a plant or animal grows when it produces new cells that increase in size. When an organism grows, cell parts must be made for each new cell formed. For growth to occur, *mitosis (replication of chromosomes & division of the nucleus)* and *cytokinesis* (division of the cell) must take place. Not all parts of a plant or an animal grow, and so not all cells of a plant an animal need to carry out mitosis and cytokinesis.

Materials
Compound microscope prepared slide of *Allium* (onion) root tip, prepared slide of Ascaris (a parasitic roundworm) embryo cells.

Procedure

- Scan the entire length of the Allium root tip slide.
    - Study under low & then high power
        - Think about these questions while doing your observation
            - In which region of the slide do you find many small, tightly packed cells?
            - Can you recognize any cells that are undergoing mitosis?
            - Do you see any cells undergoing cytokinesis?

- In the region in which you think mitosis is occurring ***sketch*** at least *five* complete cells that look different from each other.
- Compare your sketches with the graphics of a mitotic/dividing cell and try to identify your sketches
- Compare the length of time for each of the different mitotic stages.
    - Count number of cells within your field of view that are in each of the 5 stages.
    - Find class average of number of cells found in each of the different stages
- Examine an Ascaris slide - look for stages similar to those in the onion type.
    - Record any differences

Mitosis Lab

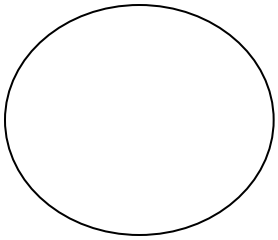
Data

Onion cell observations

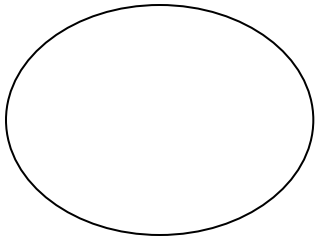
a.

b.

c.



Stage _____



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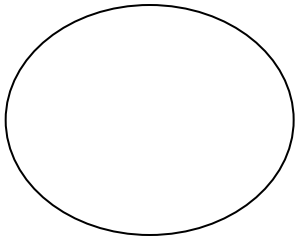

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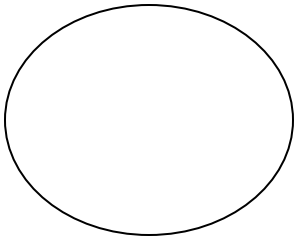

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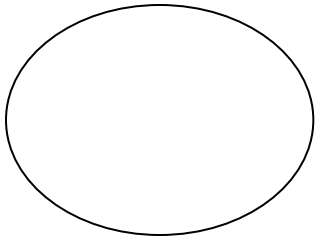


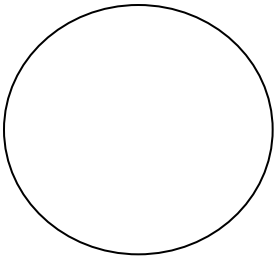
Stage _____

Number of Cells/Field of View		
	My Results	**Class Results**
Interphase		
Prophase		
Metaphase		
Anaphase		
Telophase		

Mitosis Lab

Data

Ascaris Observations



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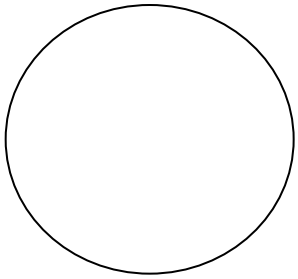

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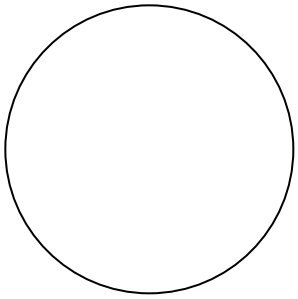
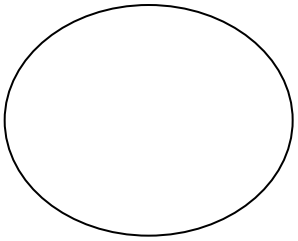
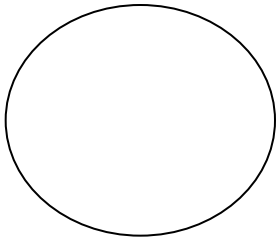


Stage_____



Stage _____



Stage _____

Differences Observed _____

Analysis

1. Mitosis produces 2 nuclei from 1 nucleus. The number of chromosomes in each new nucleus is the same as that in the nucleus from which they were formed. What does this suggest must happen to the number of chromosomes in the nucleus before it divides?

2. In which stage do you think the chromosomes are duplicated? Why does it take so long for this to occur?

3. Based on our observations, describe the differences and similarities of mitosis and cytokinesis in plant and animal cells.