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Observing Onion Cells: Mitosis Lab Integrated Science 2

You will be observing onion cells in an onion root tip and identifying different stages of mitosis. In a growing plant root, the cells at the tip of the root are constantly dividing to allow the root to grow. Because each cell divides independently of the others, a root tip contains cells at different stages of the cell cycle. This makes a root tip an excellent tissue to study the stages of cell division.

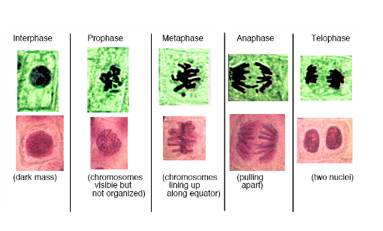


Figure 1. Mitosis in plant cells (above) and animal cells (below).

***Pre-lab. Answer the following.***

1. Why do cells divide (go through mitosis)?
2. Why is the tip of a root a good place to observe cells in the different stages of mitosis?
3. Which stage of the cell cycle do cells spend most of their lives in? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. When cells are in this stage (from #3 above) what are they doing?
5. How are the 2 new cells made at the end of mitosis similar? How are they different?

Look at the onion root tip pictures. Complete the following. **Label** the chromosomes/ nucleus in your drawings (where applicable). SHOW YOUR WORK for calculating the % of cells in each stage.

**Title** (you complete)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- | --- | --- |
| **Phase** | **Detailed Drawing** | **Questions to Answer** |
| **Interphase**  **Total # of cells in picture \_\_\_\_\_\_\_\_\_** |  | Describe the contents of the nucleus.  How many cells are in interphase? \_\_\_\_\_\_\_\_\_\_\_  % of cells in interphase? |
| **Prophase**  **(circle or highlight EACH cell in the picture that is in this stage in RED)** |  | Explain why chromosomes can now be observed, but were not observable during interphase.  How many cells are in prophase?\_\_\_\_\_\_\_\_\_\_\_\_\_  % of cells in prophase? |
| **Metaphase**  **(circle or highlight EACH cell in the picture that is in this stage in BLUE)** |  | Describe the location of the chromosomes.  How many cells are in metaphase? \_\_\_\_\_\_\_\_\_\_\_\_  % of cells in metaphase? |
| **Anaphase**  **(circle or highlight EACH cell in the picture that is in this stage in GREEN)** |  | Describe what is occurring to each chromosome pair during anaphase.  How many cells are in anaphase? \_\_\_\_\_\_\_\_\_\_\_\_\_  % of cells in anaphase? |
| **Telophase**  **(circle or highlight EACH cell in the picture that is in this stage in YELLOW)** |  | What cell parts begin to reappear during this phase?  How many cells are in telophase? \_\_\_\_\_\_\_\_\_\_\_\_\_  % of cells in telophase? |
| **Cytokinesis**  **(daughter cells)** |  | Explain how the number of chromosomes found in each daughter cell compares to the number found in the original cell before mitosis. |

Microscope Onion Root Tip

Find and draw a cell showing each stage of mitosis.

1. Be sure to include the total magnification used.
2. Draw exactly what you see in your field of view.
3. Use a highlighter to identify the cell that is either in Prophase, Metaphase, Anaphase, or Telophase.

Prophase Metaphase

|  |  |
| --- | --- |
| Total Magnification: \_\_\_\_\_\_\_\_\_ | Total Magnification: \_\_\_\_\_\_\_\_\_ |

Anaphase Telophase

|  |  |
| --- | --- |
| Total Magnification: \_\_\_\_\_\_\_\_\_ | Total Magnification: \_\_\_\_\_\_\_\_\_ |