Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Per\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_

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: \_\_\_\_\_\_\_\_\_ |