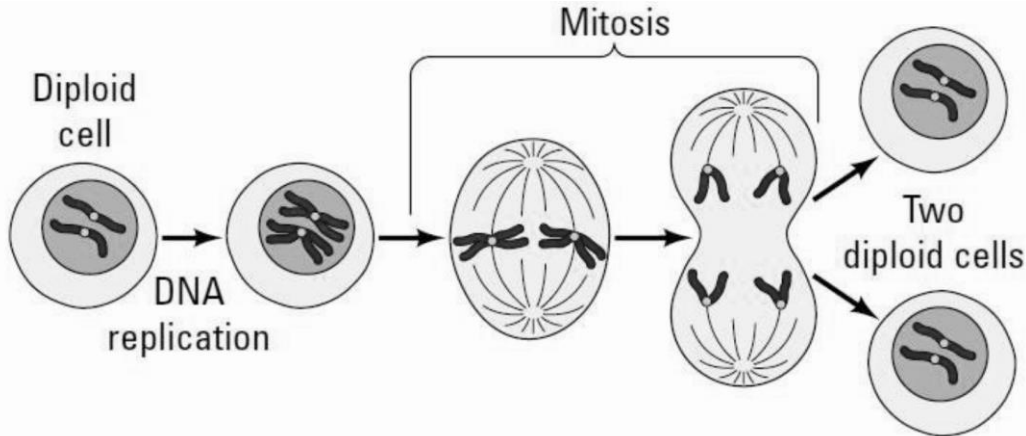


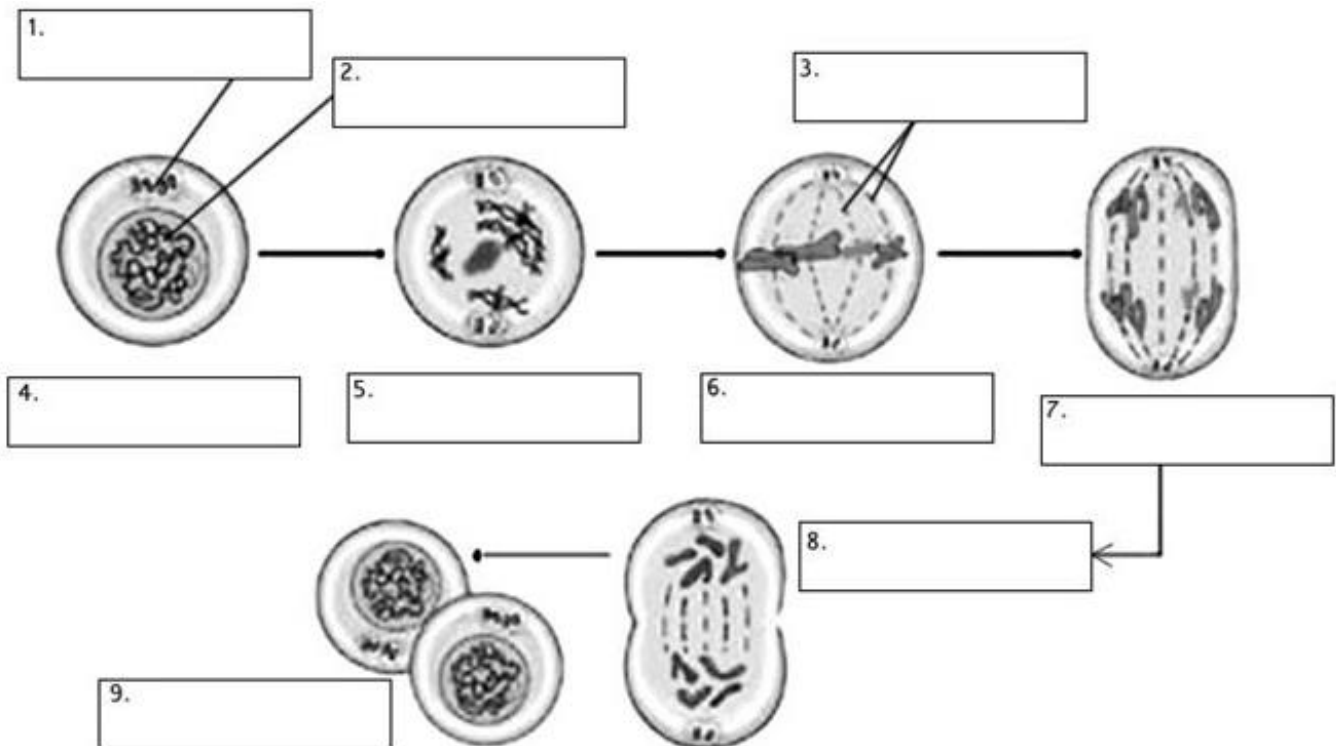
# Cell Division: Mitosis in Onion Root Tips

## Background Information

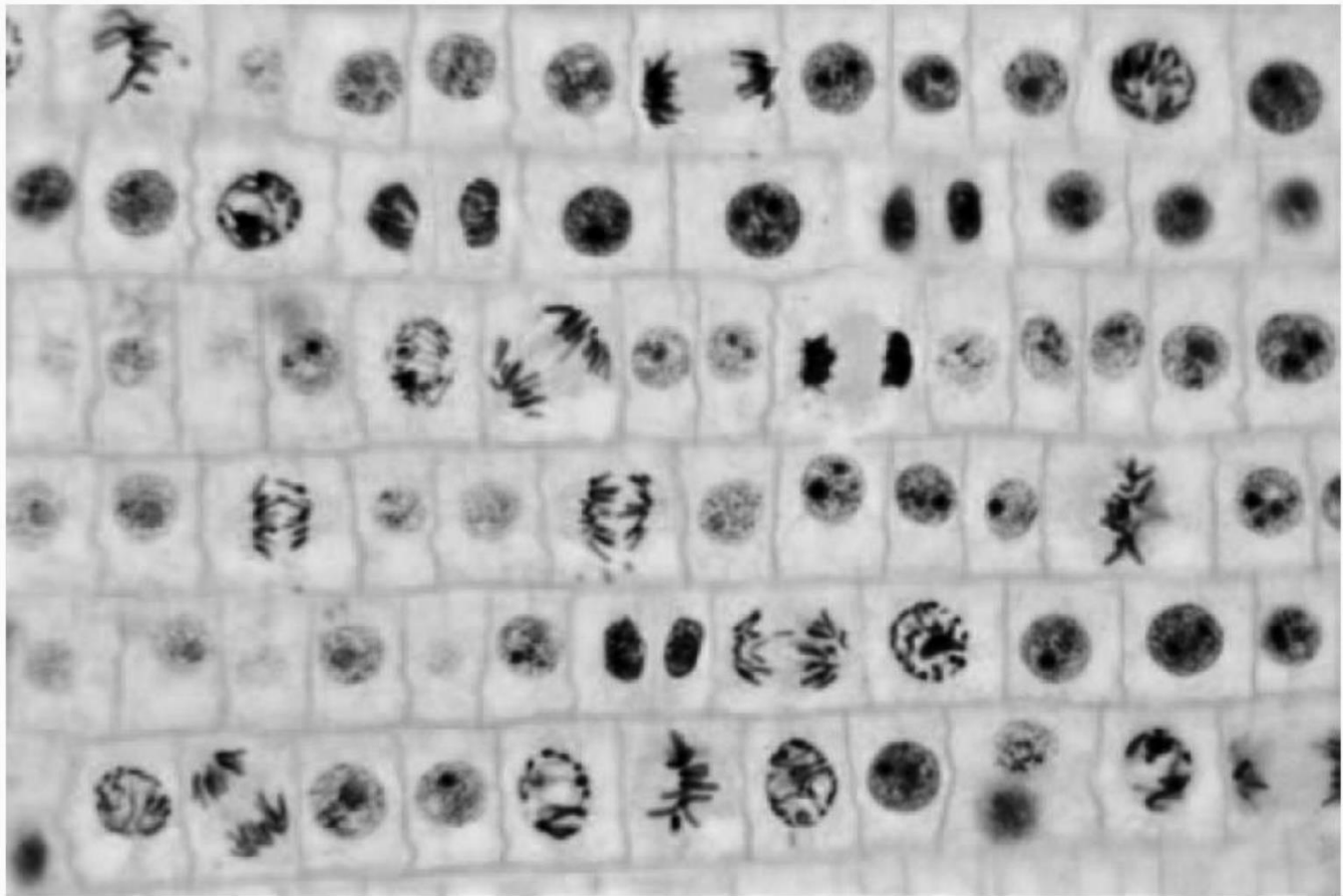


One of the characteristics of living things is the ability to replicate and pass on genetic information (DNA) to the next generation. In our last unit, you learned how DNA replicates or make copies of itself forming replicated chromosomes. In mitosis, these replicated chromosomes are separated into two **genetically identical nuclei**. In most cases, mitosis is followed by **cytokinesis**, when the cytoplasm divides and organelles separate into two new daughter cells. This type of cell division is important for *growth*, *renewal*, and *repair* of the cells that make up multicellular organisms.

## Stages of Mitosis



**Figure 1** is a photo taken of an onion root tip showing various stages of the cell cycle.



### Stages of Mitosis Preview

Complete **Table 1** below by identifying and counting the cells in various stages of the mitosis in the picture above. Then, determine the fraction and then calculate the percentage of cells in each phase and enter those values in the table below.

**Table 1: Count of Cells in the Various Stages of the Cell Cycle.**

	Interphase	Prophase	Metaphase	Anaphase	Telophase	Total
<b>Number of Cells</b>						
<b>Fraction of Cells in Phase</b>						
<b>Decimal</b>						
<b>Percent of Cell in Phase</b>						



Name \_\_\_\_\_

Lab # \_\_\_\_\_

Regents Biology

# Mitosis Lab

## Summary Sheet

1. Go to Collea's Corner and click on the:

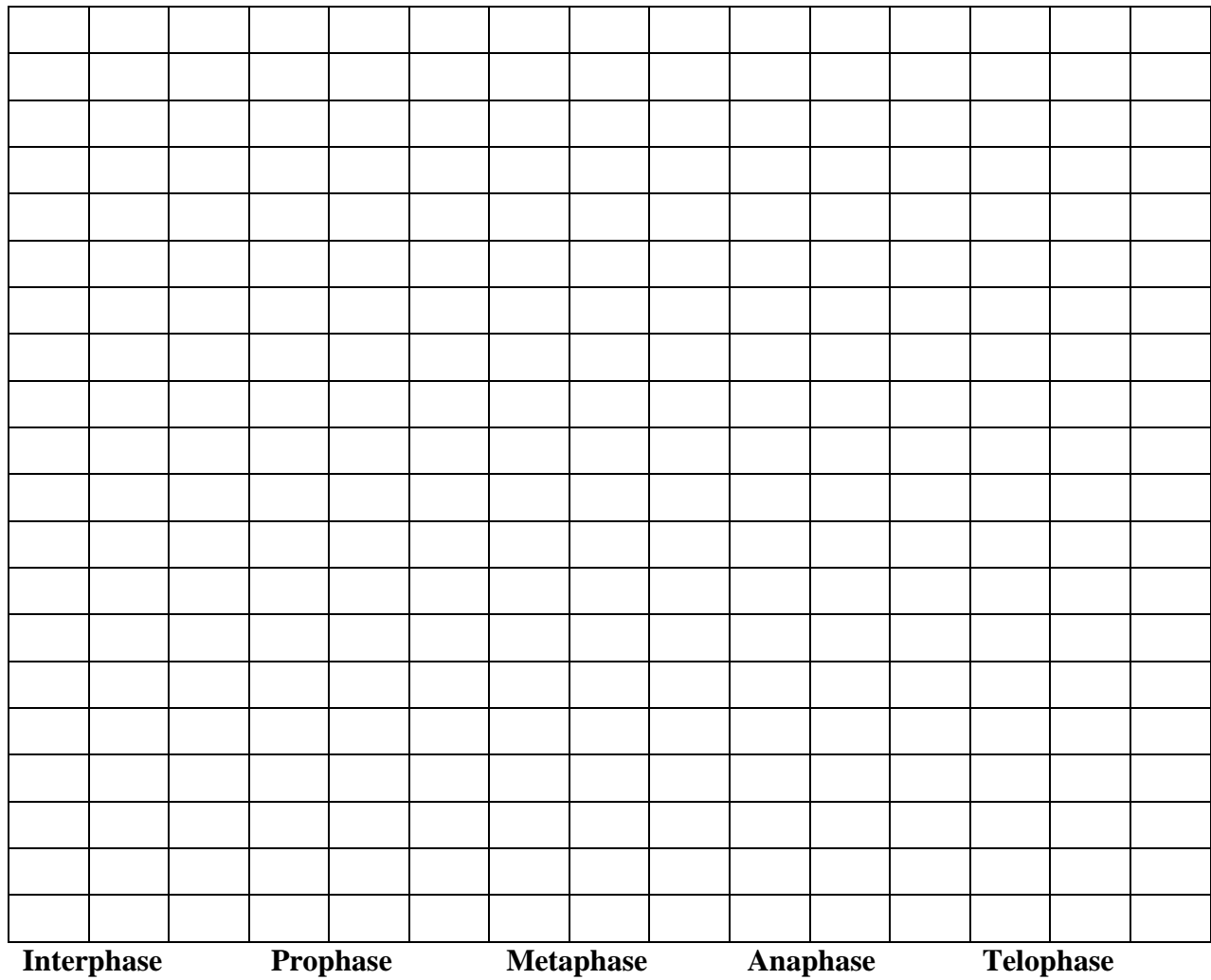
**Online Onion Root Tip Cell Mitosis Site**

[http://www.biology.arizona.edu/cell\\_bio/activities/cell\\_cycle/cell\\_cycle.html](http://www.biology.arizona.edu/cell_bio/activities/cell_cycle/cell_cycle.html)

2. Read about the stages of mitosis and then complete the activity. Use the table below to record your answers.

	Interphase	Prophase	Metaphase	Anaphase	Telophase	Total
<b>Number of Cells</b>						
<b>Fraction of Cells in Phase</b>						
<b>Decimal</b>						
<b>Percent of Cell in Phase</b>						<b>100</b>

3. Construct a BAR GRAPH below based upon the information in the table from the previous page.



4. According to your bar graph, which phase of mitosis does a cell spend the MOST amount of time in?

\_\_\_\_\_

5. According to your bar graph, which phase of mitosis does a cell spend the LEAST amount of time in?

\_\_\_\_\_

6. **Infer** from your bar graph, which phase of mitosis takes the LONGEST time?

---

7. **Infer** from your bar graph, which phase of mitosis takes the SHORTEST time?

---

8. Based upon the results, order the phases of mitosis from shortest (1) to longest (5).  
After the longest and shortest stage, give a brief explanation of why that stage may have that time period.

Interphase \_\_\_\_    Prophase \_\_\_\_    Metaphase \_\_\_\_    Anaphase \_\_\_\_    Telophase \_\_\_\_

Explanation:

---

---

---

---

---

---

9. In the chart below, sketch **IN PENCIL** and **LABEL** a cell in each phase of mitosis with a focus on the distinguishing **visible** feature of the nucleus and chromosomes.

*You may want to use your text book for assistance.*

Stage	Sketch
<b>Interphase</b>	
<b>Prophase</b>	
<b>Metaphase</b>	
<b>Anaphase</b>	
<b>Telophase</b>	

10. In humans, each cell (*except sex cells*) has how many chromosomes? \_\_\_\_\_

11. After mitosis, how many daughter cells are produced? \_\_\_\_\_

12. After mitosis (*in a human cell*), each daughter cell has how many chromosomes? \_\_\_\_\_

13. In TWO words, compare the nucleus (*genetic material*) of each new daughter cell?

\_\_\_\_\_

14. During which phase does cytokinesis begin? \_\_\_\_\_

15. What cell parts migrate to the poles during prophase? \_\_\_\_\_

16. What structure holds the two chromatids together? \_\_\_\_\_

17. During which phase does the nuclear membrane dissolve? \_\_\_\_\_

18. What structure moves the chromosomes into position and then pulls them apart?

\_\_\_\_\_

19. What is the overall purpose of mitosis?

---

---

---

---

---

---