

Name _____

Date _____

Online Lab - Onion Cell Root Tip

Purpose: To determine how much time dividing cells spend in each phase of the cell cycle.

Procedure: Follow the instructions step by step and answer questions as you go.

1. On the web browser type the following web address:

http://www.biology.arizona.edu/cell_bio/cell_bio.html

2. Under the ACTIVITIES section,

click ONLINE ONION ROOT TIPS: PHASES OF THE CELL CYCLE

3. Read the information and answer the following questions:

a. Why are onion roots used for studying the cell cycle and mitosis?

b. How are the chromosomes in each cell made visible?

c. How many phases of the cell cycle are there? Name them.

4. Take a minute to watch as the “cyber cell” goes through division.

Can you identify each phase?

5. Click NEXT

6. The life cycle of the cell is typically divided into 5 major phases. After reading the background information, answer the following questions:

a. What is a cell doing in interphase?

b. What can be said about chromosomes during interphase?

c. During interphase the nucleus is very visible in the cell.
What happens to the nucleus during mitosis?


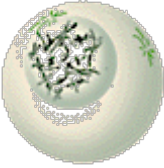


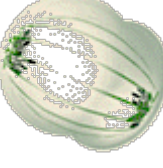
d. Where are chromosomes found during **metaphase**?

e. How do the chromosomes get there?

f. Explain the appearance of a chromosome during anaphase.

g. At the end of telophase, what material may begin to divide?

h. What phase do the graphics below represent and what major event occurs during that phase? *(Answer by filling in the table.)*

Cell undergoing Mitosis	Phase Name	Major Events
		
		
		
		
		

7. Click NEXT

8. Follow the directions given. A copy of the data table has been provided for you. Enter data at the **END** of the activity. **ROUND PERCENTAGES TO THE NEAREST WHOLE NUMBER!**

Data: Determine the amount of time required for each phase of the cell cycle, record on the data table.

	Interphase	Prophase	Metaphase	Anaphase	Telophase	Total
Number of cells						36
Percent of cells						100%
Time in minutes						720 min

Equations for data table:

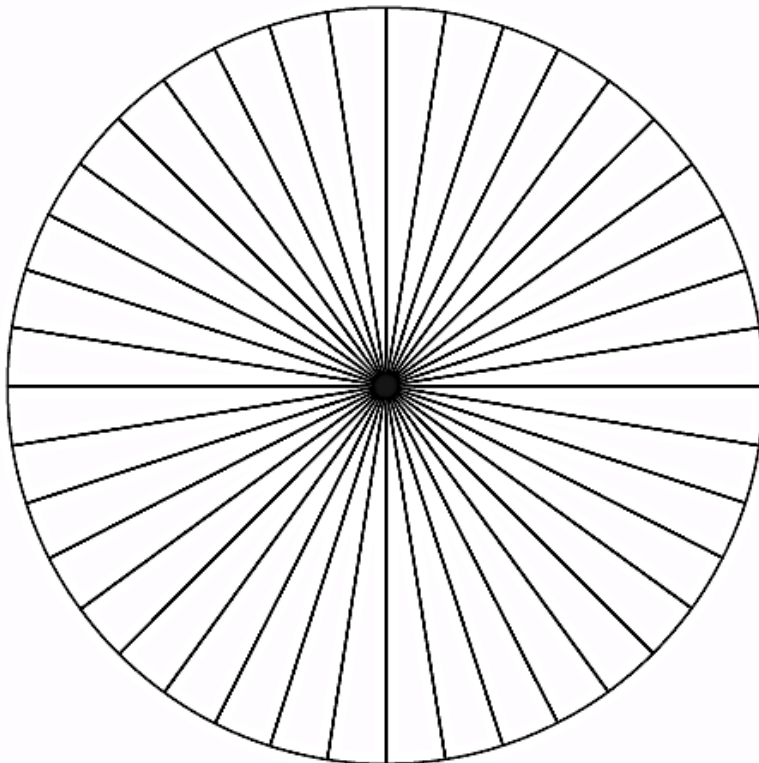
Percent of Cells: $\frac{\text{number of cells in phase}}{\text{total number of cells}} \times 100 = \underline{\hspace{2cm}}\%$

Time in minutes: 24 hours X percent in this stage in decimal

Analysis/Conclusion:

- Using your data, prepare a circle graph, which indicates the number of minutes that onion cells spend in each phase of the cell cycle. The circle is divided into 18-minute intervals. Use colored pencils to shade each region. **BE SURE TO COMPLETE A KEY.**

12 hours: 18 minute intervals



2. In which stage did the plant cell spend most of its time?

3. Why is it important that a cell spend the majority of its time in this stage (answer to 2)?
What is occurring during this stage and why is this event so important to a successful cell division?

4. What do you think would happen to the cell if the processes in this stage do not happen correctly or happen at all?

5. In which phase of mitosis did the plant cell spend least of its time?

6. What important changes occur in the nucleus during the longest phase of **mitosis**?

7. Why do you think so much time is spent in this phase (refer to 6)?

8. Based on this investigation, what is the total percent of time the plant cell spend undergoing mitosis?

9. What percent (%) of time is the plant cell ***not*** undergoing mitosis?

10. What are plant (and animal) cells doing when they are not actively undergoing mitosis (dividing)?

Assessment:

1. Click on **CELL BIOLOGY**

2. Click on **THE CELL CYCLE AND MITOSIS**

3. Click on **TEST YOURSELF (11 PROBLEMS)**

Complete the tutorial. You must correctly answer each question before you may proceed to the next question.

**** You will have a QUIZ based on these 11 problems so make sure that you know the answers quite well.**