

TIMING OF THE CELL CYCLE LAB: *a practice DCP*

The relative length of time required for the completion of the cell cycle is directly correlated with the number of cells observed in the various stages. From this information and how long the cycle takes, the time sequence of each of these stages can be worked out. Follow these steps:

Data collection table

- Observe every cell in in the two images of onion root tip tissue and determine which phase of the cell cycle it is in. The observable phases are:
 1. Interphase
 2. Prophase
 3. Metaphase
 4. Anaphase
 5. Telophase/cytokinesis (remember that telophase and cytokinesis often happen simultaneously).
- This is best done in pairs. The partner observing the images calls out the phase of each cell while the other partner records. Then switch so the recorder becomes the observer and visa versa.
- Record your results in an IB quality data collection table.

Data Processing Table and Graph

- In a data processing table, convert the number of cells in each stage of the cell cycle to a percentage, using the total number of cells counted as 100%.
- In an onion root tip, the mitotic cycle generally takes about 24 hours. This is an approximation; the actual time may vary depending on the condition of the roots during growth. On the basis of a 24-hr cycle, work out the approximate time in hours and minutes that is spent in each stage. Include this information in your data processing table. **HINT:** a common mistake is incorrectly converting decimals to minutes. For example many people would incorrectly say that 10.33 hours is 10 hours and 33 minutes, when it is actually 10 hours and 20 minutes.
- Show a worked example calculation for 1) the percentage of cells and 2) the time per each stage.
- Create an appropriate IB quality graph that displays the time of a 24 hour cycle for each stage of the cell cycle.

Questions (answer in complete sentences)

1. Which of the stages is the shortest? Does this comply with what you know to be the chromosomal events during the stage? Why?
2. Which of the stages seems to be the longest in duration? Does this comply with the information you have received about the events during this stage? Why?
3. If your observations had not been restricted to the area of the root tip that is actively dividing, how would your results have been different?

FDQ due FRIDAY.

Be sure you check the student guide for the data collection and processing scoring rubric.