Identifying mitotic phases

Identifying phases of mitosis in onion root tip. Click on the image to view larger image. The original figure without red boxes
Activity: Estimating the Time Spent in the Phases of Mitosis

Cells in your body reproduce at different rates. Skin cells reproduce frequently (about once per day); liver cells reproduce rarely (about once per year). Some specialized cells like nerve and muscle cells almost never reproduce and are in a special stage called G₀. The whole process of mitosis, prophase to telophase, takes approximately 90 min. In plants, an area of rapid growth is the tips of roots. This exercise uses onion root tips to illustrate the amount of time spent in each phase of mitosis.

1. Work as a team to look at onion root tips under the microscope. This area of the root is undergoing rapid cell reproduction.
   - If time is short, use the slides below
     - slide 1
     - slide 2
     - slide 3
     - slide 4
     - slide 5
     - slide 6
     - slide 7

2. Identify the phases of the cell cycle for 20 randomly chosen cells. Record this information in the table.
3. Trade results with 3 other people
4. In an onion root tip, the entire cell cycle takes about 12 hours or 720 minutes
5. Calculate the percentage of time spent in each phase by counting the total number of cells in each phase (total in interphase, in prophase, etc.) and dividing each by the total number of cells you counted.
6. Multiply the percentage of time in each phase by the total time of the cell cycle (720 minutes) and this gives you an estimate of the time spent in each phase.

### Number of Cells in each phase

<table>
<thead>
<tr>
<th>Interphase</th>
<th>Prophase</th>
<th>Metaphase</th>
<th>Anaphase</th>
<th>Telophase</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>You (25)</td>
</tr>
</tbody>
</table>
## Estimate of time spent in each phase of the cell cycle

<table>
<thead>
<tr>
<th>% of cells in each phase</th>
<th>Time estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interphase</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Test yourself at home**

Use the following resource [https://bio.rutgers.edu/~qb101/lab2_mitosis/section1_frames.html](https://bio.rutgers.edu/~qb101/lab2_mitosis/section1_frames.html) to test yourself and practice without a microscope.

**Tags:** [visual communication](#)