Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Observing the Cell Cycle in Plant Cells**

**Purpose**: 1) To practice observing and recording cells under a microscope

 2) To find out which phase most cells are in and why

**Materials**:

* Microscope
* Prepared Slide of an onion root tip

**Procedure:**

1. Carefully carry over a microscope to your bench. Use two hands to carry the scope, one on the base (supporting most of the weight) and the other on the neck.
2. Remove the safety cover and plug in the microscope.
3. Make sure the low power objective lens is down above the stage.
4. Review the parts of the microscope. Locate the course –adjustment knob and the fine adjustment knob. Ensure the light is on. Adjust the diaphragm while looking through the eyepiece (this will change the amount of light entering the eyepiece.
5. Make sure the low power objective lens is over the stage then place the slide on the microscope stage. Centre the specimen over the light.
6. Focus the image under low power using the course adjustment knob. Find the cells that appear to be dividing. These will be toward the root cap, the narrower end of the specimen.
7. Draw a scientific drawing of the root tip at low power. Label the region of cell division. Refer to steps outlined in results for a good scientific drawing!
8. Determine the magnification at low power and record. Use the following :

**Total magnification = ocular lens power X objective lens power**

1. Once you have centred the dividing cells in the field of view, rotate the nosepiece to the medium power lens and focus using the fine adjustment knob. Locate cells that are dividing.
2. Draw a scientific drawing of the root tip at medium power. Label the region of cell division and determine and record the magnification. Refer to steps outlined in results for a good scientific drawing!
3. Carefully rotate the high-power lens to above the specimen. **Focus the image using the fine adjustment knob.**
4. Draw and label a cell in three different stages of the cell cycle. Then label the structures that you can identify. They may include the nucleus, chromosomes, spindle fibres, cell plate and cell wall. Draw and label only the cell structures that you actually observe under the microscope. Refer to steps outlined for a good scientific drawing!

**Data**:

#### **Checklist for good scientific drawing**

* Use a sharp pencil
* Draw as large as necessary to show details clearly
* Do not shade or colour
* Label parts of diagram using straight and parallel lines that run outside your drawing. Use a ruler for this!
* Include labels, a title and the magnification for each diagram

|  |  |
| --- | --- |
| **Low Power**  | **Medium Power**  |
| circle1C | circle1C |
| **Total Magnification:**  | **Total Magnification:**  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Prophase:

|  |
| --- |
|  |

 | Metaphase:

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| --- |
|  |

 | Anaphase:

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| --- |
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| Telophase:

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|  |

 | Cytokinesis:

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| --- |
|  |

 | Interphase:

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**Other observations** *(other things you saw*)**:**

**Analysis:**

1. From your observations, which event of the cell cycle occurs most frequently?
2. Based on your observations, which phase takes the longest period of time?
3. Are the answers to these two questions linked? Explain and relate your response to what you saw.

**Conclusion:**

Using your observations, which phase are more of the cells in and why do you think this is the case?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** | **5** |
| **PostLab Questions** | * Most answers to questions are wrong and/or incomplete
* Understanding of the lab is not shown
 | * Answers to four or five questions are incomplete and/or wrong
* Analysis is inconsistent
 | * Questions are answered in complete sentences with two or three errors
* Analysis is general
 | * Questions are answered in complete sentences with one error
* Analysis shows a good understanding
 | * Questions are correctly answered and in complete sentences
* Analysis is insightful showing a high level of understanding
 |
| **Scientific Diagrams** | * Diagrams are poorly drawn or incomplete. Labels are absent or inaccurate.
* The checklist and steps outlined in the text for drawing a scientific drawing were not followed.
* Drawings do not meet expectations for scientific drawings.
 | * Diagrams are quickly drawn. Some labels are missing or inaccurate.
* Several points on the checklist and steps outlined in the text for drawing scientific drawings were not followed.
* Completed drawings require more details and do not meet expectations for scientific drawings.
 | * All diagrams are complete and labeled appropriately
* Most points on the checklist and steps outlined in the text for drawing scientific drawings were followed.
* Completed drawings are satisfactory examples of scientific drawings
 | * All diagrams are carefully and clearly draw and labeled appropriately
* The checklist and steps outlined in text for drawing scientific drawings were followed.
* Completed drawings are good examples of scientific drawings
 | * All diagrams are carefully and clearly draw and labeled appropriately
* The checklist and steps outlined in text for drawing scientific drawings were followed.
* Completed drawings are excellent examples of scientific drawings
 |
| **Conclusion** | * No conclusion was included or shows little effort and reflection on the lab
 | * A statement of the results is incomplete with little reflection on the lab
 | * A statement of the results of the lab indicates a good understanding of the topic.
 | * Accurate statement of the results of the lab indicates a good understanding of the topic. Observations from the lab were used in the analysis.
 | * Accurate statement of the results of the lab indicates a good understanding of the topic. Specific observations and examples from the lab procedure were used throughout the analysis.
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