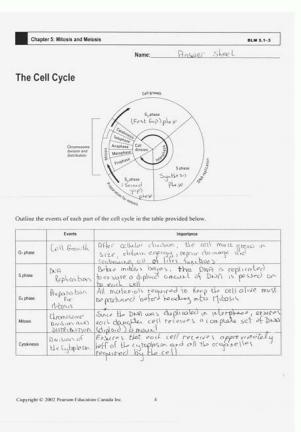


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**The Eukaryotic Cell Cycle and Cancer**

**Teacher Resources**

**1014-1015**

**Student Worksheet**

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**INTRODUCTION**

This lesson introduces the cell cycle, the eukaryotic cell cycle, and cancer with attention to the importance of the cell cycle as a cause and the progression of the disease as a result of uncontrolled cell division.

**QUESTION**

What mechanisms of progression through the cell cycle can prevent the progression? How do these relate to the "checkpoints" in the cycle?

1. Explain what causes the reason for normal progression through stages and how it is regulated.

Normal progression must be balanced because if tissue is going to grow and replace damaged or dead cells, cell division is also. This way's regulation puts importance in it is important because if it's out of balance, as in the case with cancer, the cells constantly grow and divide.

2. Explain an example of uncontrolled normal progression as well as progression when mutated.

Uncontrolled progression because just regular absence in stages in older and just cells where they are constantly because they have to make new or repair damage.

3. Define the two types of control.

Control directly and indirect controls. Phage control is equivalent to cell division.

4. List three differences in the two types of controls.

Cells which have been infected cannot divide. They cannot reproduce and because.

5. What is a cancer trigger response?

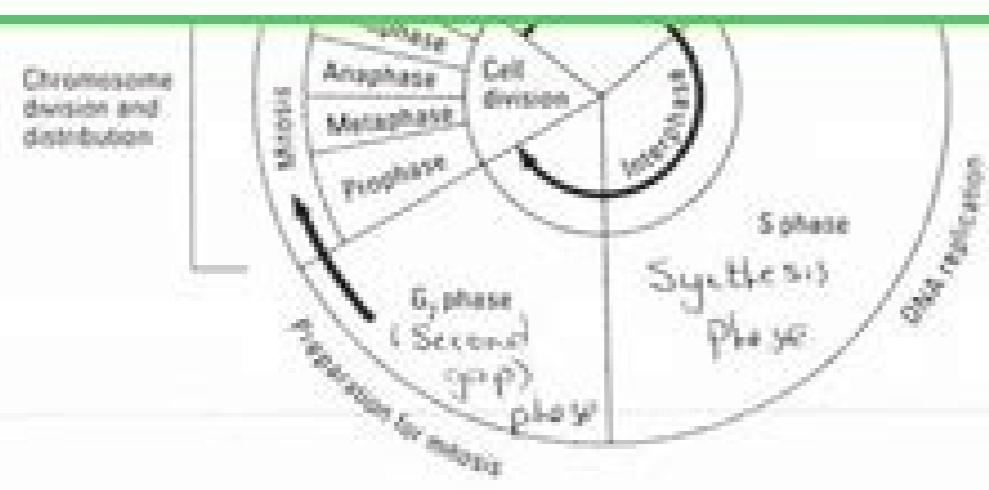
A process that stimulates unnecessary cells during the development and removal unhealthy or damaged cells.

6. Explain what makes the right system critical to regulating the cell cycle. What are "checkpoints"?

Cancer triggers can send the wrong signals. You can't tell which cell should not be dividing or the ones that you want.

7. Sketching a cell of any type you know, map the cell showing the following in its nucleus:

Chromosome distribution	They start off like bubbles near the cell membrane before above parts of the cell.
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Outline the events of each part of the cell cycle in the table provided below.

Events	Importance
G <sub>1</sub> phase	Cell Growth
S phase	DNA Replication
G <sub>2</sub> phase	Preparation For Mitosis
Mitosis	Chromosomes
Interphase	Chromosome distribution
Mitosis	Cell division
Anaphase	Cell division
Metaphase	Cell division
Prophase	Cell division
G <sub>1</sub> phase (Second)	Preparation for mitosis
T <sub>1</sub> P <sub>1</sub> play	Preparation for mitosis
S phase	DNA replication

# LabBench Activity

## Mitosis and Meiosis

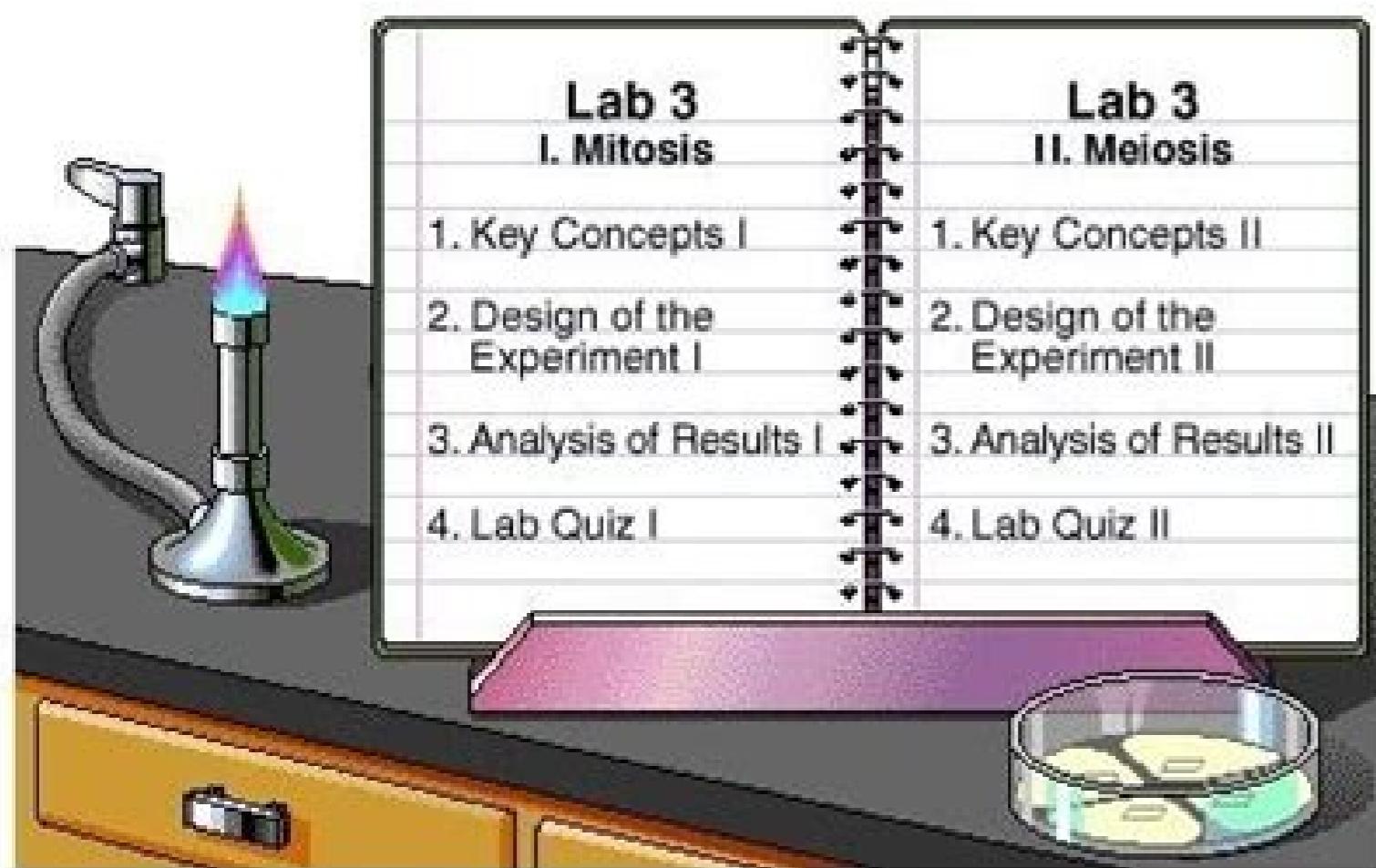
by Theresa Knapp Holtzclaw

### Introduction

For organisms to grow and reproduce, cells must divide. Mitosis and meiosis are both processes of cell division, but their outcomes are very different.

In this laboratory, you will:

1. Study the process of mitosis in plant and/or animal cells using slides of onion root tips or whitefish blastulae
2. Review the process of meiosis in a simulation activity with beads, and then investigate crossing over during meiosis in a fungus



The Eukaryotic Cell Cycle and Cancer - Overview

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8. Fill in the details about what happens during the three phases of interphase labeled in the diagram.

A circular diagram representing the cell cycle. It is divided into four main sections: G1 (the largest section), S (Synthesis phase), G2 (the second largest section), and M (Mitosis). The G1, S, and G2 sections are collectively labeled as "Interphase". In the center of the circle is a purple circle containing the text "Cell Cycle Phases", "Cell Cycle Progression and Control", and "Cell Cycle Checkpoints".

9. In general, what is the purpose of a checkpoint in the cell cycle?

10. What is the G0 phase of the cell cycle?

- Which factors determine whether a cell enters G0?
- Can cells leave G0?

Click on "Cell Cycle Regulators and Cancer" in the center purple circle. Read the "Regulators Overview" and then read through the "Cancer Overview" and watch the videos.

11. What are cell cycle regulators?

- Stimulating proteins are encoded by \_\_\_\_\_. Examples include: \_\_\_\_\_
- Inhibitory proteins are encoded by \_\_\_\_\_. Examples include: \_\_\_\_\_

Cell Cycle  
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The cell cycle and cancer answer key. Amoeba sisters cell cycle and cancer worksheet answer key. Mitosis and cancer worksheet answer key. Cell division and cancer review answer key. The eukaryotic cell cycle and cancer in depth student worksheet answer key. Cell cycle mitosis and cancer review worksheet answer key. Cell cycle and cancer review answer key. The eukaryotic cell cycle and cancer overview worksheet answer key.

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All cancers begin when a gene mutation gives rise to a faulty protein that participates in the process of cell reproduction. If repairs are unsuccessful, p53 signals apoptosis, apoptosis.



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