**Unit 7 – Cell Division**

**MCAS Frameworks:** This unit addresses the following MA State Frameworks in Biology:

* 1. Describe the cell cycle and the process of mitosis. Explain the role of mitosis in the formation of new cells, and its importance in maintaining chromosome number during asexual reproduction.

**SIS1.** Make observations, raise questions, and formulate hypotheses.

**SIS2.** Design and conduct scientific investigations.

**SIS3.** Analyze and interpret results of scientific investigations.

**SIS4.** Communicate and apply the results of scientific investigations.

**Big Ideas**

1. Cellular replication is regulated by interactions among cells and internal molecules.
2. Cancer is a disorder of the cell cycle.

**Essential Questions**

1. Why do cells have to grow and divide?
2. How can both cancer and evolution be interpreted as alterations of the cell cycle?

**Unit 7 - Cell Division**

**Reading:** Chapters 10-1, 10-2, 10-3

**Objectives:** By the conclusion of this unit the student should be able to:

**Cell Growth (Chapter 10-1)**

1. Explain which increases more rapidly as a cell increases in size – its volume or surface area and discuss the problems this causes for cells (at least two problems).
2. Explain how cell division solves the problems in Obj 1 and give two reasons for cell division.

**Cell Division (Chapter 10-2)**

1. Define and relate the following terms: parent cell, daughter cells, mitosis, cytokinesis, chromosomes, DNA, sister chromatids, centromere.
2. Describe the main events of the cell cycle, including what happens during each stage of interphase.
3. Describe the major events that take place during the four phases of mitosis, as well as cytokinesis.
4. Identify and draw what you would expect a cell to look like during each stage of mitosis.
5. Explain two ways in which plant and animal cells differ in the way they perform mitosis.

**Regulating the Cell Cycle (Chapter 10-3)**

1. Identify one factor that can stop cells from growing and describe the experiment that demonstrates this.
2. Describe the factors that can regulate a cell cycle both internally and externally.
3. Explain how cancer cells are different from other cells and why cancer can be considered a disease of the cell cycle.

**Key Terms/Concepts:**

|  |  |
| --- | --- |
| Cell division  Interphase  Prophase  External regulators  Mitosis  Cell cycle  Centrioles  Cancer  Cytokinesis  G1 phase, S phase, G2 phase  Spindle | Parent cell  Metaphase  Daughter cells  Anaphase  Chromosomes  Telophase  Sister chromatids  Cyclin  Centromeres  Internal regulators |

**Assessment Evidence**

Project: Cell Cycle Cartoon

Project: Mitosis Webquest

Lab: Popbead mitosis

Assessment: Unit test

Observation: Teacher observation and feedback

**Unit Plan: Period 6**

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| --- | --- | --- |
| **Day** | **Topic** | **Homework** |
| Mon 2/27  Day F | Introduction Cell Division | Objectives 1-4 |
| Tues 2/28  Day A | No Class |  |
| Wed 2/29  Day B | Cell Growth and Chromosome Structure  Cell Cycle | Objectives 5-7 |
| Thur 2/30  Day C | Cell Cycle Cartoon | Objectives 8-10 |
| Fri 3/1  Day D | Mitosis | Finish worksheets |
| Mon 3/5  Day E | Mitosis Webquest | Finish webquest |
| Tue 3/6  Day F | Mitosis Pop Bead Lab | Finish Lab , Study for  Test |
| Wed 3/7  Day A | No Class |  |
| Thur 3/8  Day B | Review | Study for Test |
| Fri 3/10  Day C | ***Test Cell Growth and Division*** | Objectives to be announced |

**Assessment Evidence**

Project: Cell Cycle Cartoon

Project: Mitosis Webquest

Lab: Popbead mitosis

Assessment: Unit test

Observation: Teacher observation and feedback

**Unit Plan: Period 5**

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| **Day** | **Topic** | **Homework** |
| Mon 2/27  Day F | Introduction Cell Division | Objectives 1-4 |
| Tues 2/28  Day A | Cell Growth and Chromosome Structure  Cell Cycle | Objectives 5-7 |
| Wed 2/29  Day B | No Class |  |
| Thur 2/30  Day C | Cell Cycle Cartoon | Objectives 8-10 |
| Fri 3/1  Day D | Mitosis | Finish worksheets |
| Mon 3/5  Day E | Mitosis Webquest | Finish webquest |
| Tue 3/6  Day F | Mitosis Pop Bead Lab | Finish Lab , Study for  Test |
| Wed 3/7  Day A | Review | Study for Test |
| Thur 3/8  Day B | No Class |  |
| Fri 3/10  Day C | ***Test Cell Growth and Division*** | Objectives to be announced |