

# **Module 07: Mitosis — Keys to Success**

## **Key Learning Objectives**

### **1. Cell Cycle Overview**

- Describe the stages of the cell cycle (G1, S, G2, M)
- Explain what happens during interphase
- Understand why cells need to divide
- Compare cell division in different cell types

### **2. DNA Replication**

- Explain why DNA must be replicated before cell division
- Describe the semi-conservative model of DNA replication
- Identify key enzymes involved (helicase, DNA polymerase, ligase)
- Understand how the cell ensures accurate copying

### **3. Chromosome Structure**

- Define chromatin, chromosomes, and chromatids
- Explain the structure of a duplicated chromosome
- Identify the centromere and its role
- Distinguish between diploid and haploid cells

### **4. Stages of Mitosis**

- Describe the events of each phase: prophase, metaphase, anaphase, telophase
- Explain the role of the mitotic spindle
- Understand how chromosomes are accurately distributed

### **5. Cytokinesis**

- Compare cytokinesis in plant and animal cells

- Explain the formation of the cleavage furrow and cell plate
- Describe the final result of cell division

## 6. Cell Cycle Regulation

- Describe the role of checkpoints in the cell cycle
  - Explain how cyclins and CDKs control the cell cycle
  - Understand how uncontrolled cell division leads to cancer
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### Study Tips

1. **Memorize the phases** using mnemonics (e.g., PMAT)
2. **Draw and label** each stage of mitosis
3. **Create timeline diagrams** of the cell cycle
4. **Compare mitosis** in different organisms
5. **Watch animations** of cell division processes