

## **CHAPTER 12 THE CELL CYCLE**

### **Learning objectives**

#### **The Key Roles of Cell Division**

1. Understand that cell division functions in reproduction, growth, renewal and repair.
2. Explain how chromatin, chromosomes and genomes relate to one another
3. Describe the difference between a somatic cell and a gamete.

#### **The Mitotic Cell Cycle**

1. Describe the process of binary fission in bacteria.
2. List the phases of the cell cycle and describe the sequence of events that occurs during each phase.
3. List the phases of mitosis and describe the major events characteristic of each phase.
4. Recognize the phases of mitosis from diagrams and micrographs. Be able to draw the phases of mitosis given a certain number of chromosomes.
5. Draw or describe the mitotic spindle, including centrosomes, kinetochore microtubules, nonkinetochore microtubules, asters, and centrioles (in animal cells).
6. Compare and contrast cytokinesis in animals and plants.

#### **Regulation of the Cell Cycle**

1. Describe the roles of checkpoints, cyclin, Cdks, and MPF in cell cycle control
2. Describe the internal and external factors that influence the cell cycle control system.
3. Be able to give examples of each.