CHAPTER 8 The Cellular Basis of Reproduction and Inheritance

OBJECTIVES

Connections Between Cell Division and Reproduction

Introduction
Describe the role of cell division in asexual and sexual reproduction of a sea star.
8.1 Compare the relationship between a parent and its offspring resulting from asexual versus sexual reproduction.
8.2 Explain the significance of Virchow's principle regarding cellular reproduction.
8.3 Explain how daughter prokaryotic chromosomes are separated from each other during binary fission.

The Eukaryotic Cell Cycle and Mitosis
8.3-8.4 Compare the structure of prokaryotic and eukaryotic chromosomes.
8.5 Describe the stages and significance of the cell cycle.
8.6 List the phases of mitosis and describe the events characteristic of each phase. Recognize the phases of mitosis from diagrams and micrographs.
8.7 Compare cytokinesis in animals and plants.
8.8-8.9 Explain how anchorage, cell density, and growth factors control the cell cycle.
8.10 Explain how cancerous cells are different from healthy cells; distinguish between benign and malignant tumors; and explain the strategies behind some common cancer treatments.
8.11 Describe the functions of mitosis.

Meiosis and Crossing Over
8.12 Explain how chromosomes are paired.
8.13 Distinguish between a) somatic cells and gametes, b) diploid cells and haploid cells, and c) autosomes and sex chromosomes.
8.14 List the phases of meiosis I and meiosis II and describe the events characteristic of each phase. Recognize the phases of meiosis from diagrams or micrographs.
8.15 Describe key differences between mitosis and meiosis. Explain how the end result of meiosis differs from that of mitosis.
8.16-8.18 Explain how independent orientation, crossing over, and random fertilization contribute to genetic variation in sexually reproducing organisms.

Alterations of Chromosome Number and Structure
8.19 Explain how and why karyotyping is performed.
8.20 Describe the causes and symptoms of Down Syndrome.
8.21 Define nondisjunction and explain how it can occur.

8.22 Describe the consequences of abnormal numbers of sex chromosomes.
8.23 Describe the main types of chromosomal changes. Explain why cancer is not usually inherited.