

BRIEF CONTENTS

- 1** An Introduction to Biology 1

Unit I Chemistry 18

- 2** The Chemical Basis of Life I: Atoms, Molecules, and Water 19
3 The Chemical Basis of Life II: Organic Molecules 35

Unit II Cell 54

- 4** General Features of Cells 55
5 Membrane Structure, Transport, and Cell Junctions 87
6 Energy, Enzymes, and Cellular Respiration 111
7 Photosynthesis 137
8 Cell Communication 156

Unit III Genetics 172

- 9** Nucleic Acid Structure, DNA Replication, and Chromosome Structure 173
10 Gene Expression at the Molecular Level 194
11 Gene Regulation 214
12 Mutation, DNA Repair, and Cancer 234
13 The Eukaryotic Cell Cycle, Mitosis, and Meiosis 252
14 Patterns of Inheritance 275
15 Genetics of Viruses and Bacteria 303
16 Genetic Technology 323
17 Genomes, Repetitive Sequences, and Bioinformatics 343

Unit IV Evolution 360

- 18** The Origin and History of Life on Earth 361
19 An Introduction to Evolution and Population Genetics 382
20 Origin of Species and Macroevolution 410
21 Taxonomy and Systematics 426

Unit V Diversity 442

- 22** Microorganisms: The Archaea, Bacteria, and Protists 443
23 Plant Evolution and Diversity 470
24 Fungi 493

- 25** Animal Diversity: Invertebrates 509
26 Animal Diversity: The Vertebrates 543

Unit VI Plants 568

- 27** An Introduction to Flowering Plant Form and Function 569
28 Flowering Plants: Behavior 589
29 Flowering Plants: Nutrition and Transport 606
30 Flowering Plants: Reproduction 629

Unit VII Animals 647

- 31** Animal Bodies and Homeostasis 648
32 Neuroscience I: Structure, Function, and Evolution of Nervous Systems 666
33 Neuroscience II: Sensory Systems 694
34 Muscular-Skeletal Systems 715
35 Digestive Systems and Nutrition 730
36 Circulatory Systems 753
37 Respiratory Systems 770
38 Excretory Systems and the Homeostasis of Internal Fluids 786
39 Endocrine Systems 803
40 Animal Reproduction and Development 824
41 Immune Systems 849

Unit VIII Ecology 869

- 42** Animal Behavior 870
43 Ecology and the Physical Environment 886
44 Population Ecology 902
45 Community Ecology 922
46 Ecosystem Ecology 937
47 Biodiversity and Conservation Biology 953

Appendix A: Periodic Table of the Elements A-1

Appendix B: Answers to In-Chapter and End-of-Chapter Questions B-1

Credits C-1

Index I-1