

## CONTENTS

1 The Origin of Living Things	
1 The Science of Biology	2
2 The Nature of Molecules	20
3 The Chemical Building Blocks of Life	39
4 The Origin and Early History of Life	61
II Biology of the Cell	
5 Cell Structure	78
6 Membranes	107
III Energetics	
7 Energy and Metabolism	134
8 Cellular Respiration	153
9 Photosynthesis	179
IV Reproduction and heredity	
10 The Cell Cycle: Mitosis	202
11 Sexual Reproduction and Meiosis	218
12 Patterns of Inheritance	231
13 Human Genetics	258
V Molecular Genetics	
14 DNA: The Genetic Material	280
15 Genes and How They Work	300
16 Mutation	320
17 Recombination	336
18 Gene technology	350
VI Evolution	
19 Genes within Populations	370
20 The Evidence of Evolution	385
21 The Origin of Species	404
22 Evolutionary History of the Earth	423
VII Ecology	
23 Population Dynamics	450
24 Coevolution and Symbiosis: Interactions within communities	469
25 Dynamics of Ecosystems	486
26 Atmosphere, Oceans, and Biomes	505
27 The Future of the Biosphere	531
VIII Biology of viruses and simple Organisms	
28 The Five Kingdoms of Life	560

29	Viruses	573
30	Bacteria	589
31	Protists	610
32	Fungi	636
IX Biology of Plants		
33	Diversity of Plants	656
34	Flowering Plants	683
35	Vascular Plant Structure	701
36	Nutrition and Transport in Plants	726
37	Plant Development	744
38	Regulations of Plant Growth	760
X Biology of Animals		
39	The Primitive Invertebrates	780
40	Mollusks and Annelids	804
41	Arthropods	825
42	Echinoderms and Chordates	853
XI Vertebrate Biology		
43	Organization of the Vertebrate Body	884
44	Neurons	902
45	The nervous System	917
46	Sensory Systems	940
48	Locomotion	987
49	Fueling Body Activities: Digestion	1009
50	Respiration	1031
51	Circulation	1052
52	The Immune System	1080
53	Kidneys and Water Balance	1114
54	Sex and Reproduction	1128
55	Development	1154
56	Animal Behavior	1176
57	Behavioral Ecology	1198
Appendices		
A	Classification of Organisms	A-1
B	Answers to Review Questions	B-1
C	Answers to Genetics Problems	C-1
	Glossary	G-1
INDEX		1-1