



Contents

Introduction	3		
Biology		Chemistry	
Unit 1 Plants		Unit 6 States of matter	
1.1 Photosynthesis	6	6.1 Particle theory	68
1.2 Leaves	8	6.2 Diffusion	70
1.3 Investigating photosynthesis	10	6.3 Investigating diffusion	72
1.4 Roots	12	6.4 Brownian motion	74
1.5 Transporting water and minerals	14	6.5 Gas pressure	76
End of unit questions	16	End of unit questions	78
Unit 2 Food and digestion		Unit 7 Elements and compounds	
2.1 Nutrients	18	7.1 Atoms	80
2.2 A balanced diet	20	7.2 Atoms and elements	82
2.3 Digestion and absorption	22	7.3 The Periodic Table	84
2.4 The human digestive system	24	7.4 Compounds	86
2.5 Teeth	26	7.5 Formulae	88
2.6 Enzymes	28	End of unit questions	90
End of unit questions	30	Unit 8 Mixtures	
Unit 3 The circulatory system		8.1 Compounds and mixtures	92
3.1 The human circulatory system	32	8.2 More about mixtures	94
3.2 The heart	34	8.3 Separating mixtures	96
3.3 Blood	36	8.4 Chromatography	98
3.4 Blood vessels	38	8.5 Solutions	100
End of unit questions	40	8.6 Solubility	102
Unit 4 Respiration		8.7 Solubility investigation	104
4.1 The human respiratory system	42	End of unit questions	106
4.2 Gas exchange	44	Unit 9 Material changes	
4.3 Aerobic respiration	46	9.1 Physical and chemical changes	108
4.4 Keeping fit	48	9.2 Burning	110
4.5 Cigarettes and health	50	9.3 Reactions with acids	112
End of unit questions	52	9.4 Rearranging atoms	114
Unit 5 Reproduction and development		9.5 More about conservation of mass	116
5.1 Gametes	54	9.6 Detecting chemical reactions	118
5.2 The human reproductive system	56	9.7 Rusting	120
5.3 What happens to the egg cell?	58	End of unit questions	122
5.4 From embryo to baby	60		
5.5 Growth and development	62		
5.6 Lifestyle and health	64		
End of unit questions	66		

Physics

Unit 10 Measuring motion

10.1	How fast? – Measuring speed	124
10.2	Speed check	126
10.3	Speed calculations	128
10.4	Patterns of movement	130
10.5	Distance/time graphs	132
	End of unit questions	134

Unit 11 Sound

11.1	Changing sounds	136
11.2	Looking at vibrations	138
11.3	How sound travels	140
11.4	Sounds on a screen	142
11.5	How we hear	144
	End of unit questions	146

Unit 12 Light

12.1	How light travels	148
12.2	How shadows form	150
12.3	How reflections form	152
12.4	How light bends	154
12.5	The spectrum of white light	156
12.6	Coloured light	158
	End of unit questions	160

Unit 13 Magnetism

13.1	Magnets and magnetic materials	162
13.2	Magnetic poles	164
13.3	Magnetic field patterns	166
13.4	Making an electromagnet	168
13.5	A stronger electromagnet	170
13.6	Electric currents make magnetic fields	172
	End of unit questions	174

Reference

Making better measurements	176
Measuring instruments	176
Improving accuracy	177
Anomalous results	178
Understanding equations	179
Glossary and index	181
Acknowledgements	189