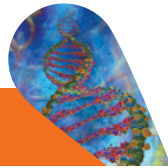


# Contents

Acknowledgements	iii
How to use this book	x
Verbs	xii
Science takes you places— Look who is using science	xiv



## 1 DNA and genetics

1.1 DNA the molecule	2
Learning Across the Curriculum	
<i>Discovery of DNA</i>	5
1.1 Unit review	7
1.1 Practical investigations	8
1.2 Making new cells	10
1.2 Unit review	17
1.2 Practical investigations	19
1.3 Characteristics and inheritance	20
1.3 Unit review	26
1.3 Practical investigations	28
1.4 Gene technology	29
1.4 Unit review	34
1.4 Practical investigations	35
1.5 Biotechnology	36
1.5 Unit review	41
1.5 Practical investigations	42
Chapter review	42
Thinking scientifically	44
Glossary	46



## 2 Geological time

2.1 Fossils	49
Learning Across the Curriculum	
<i>Ediacaran fauna</i>	56
2.1 Unit review	57
2.1 Practical investigations	58
2.2 Dating techniques	59
2.2 Unit review	64
2.2 Practical investigations	66
2.3 Geological time scale	68
Learning Across the Curriculum	
<i>Reconstructing dinosaurs</i>	73

2.3 Unit review	75
2.3 Practical investigations	76
Chapter review	78
Thinking scientifically	79
Glossary	80

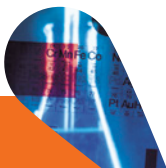


## 3 Natural selection and evolution

3.1 Changes over generations	82
Learning Across the Curriculum	
<i>Breeding a better lupin</i> <b>ADDITIONAL</b>	88
3.1 Unit review	90
3.1 Practical investigation	91
3.2 Natural selection	92
3.2 Unit review	97
3.2 Practical investigations	98
3.3 Speciation and evolution	100
Learning Across the Curriculum <b>ADDITIONAL</b>	
<i>Genomics, bioinformatics and evolution</i>	105
3.3 Unit review	106
3.3 Practical investigations	108
3.4 Human evolution	110
3.4 Unit review	114
3.4 Practical investigations	115
Chapter review	117
Thinking scientifically	118
Glossary	119
Science takes you places— Look who is using science	120

# Contents

## 4 The periodic table



4.1 Atoms and elements	122
4.1 Unit review	126
4.1 Practical investigations	127
4.2 Arranging the elements	129
Learning Across the Curriculum	
<i>Development of the periodic table</i>	133
4.2 Unit review	135
4.2 Practical investigations	136
4.3 Family groupings	138
4.3 Unit review	144
4.3 Practical investigations	145
4.4 Electrons and the periodic table	147
<b>ADDITIONAL</b>	
4.4 Unit review	152
4.4 Practical investigations	153
<b>Chapter review</b>	<b>154</b>
<b>Thinking scientifically</b>	<b>155</b>
<b>Glossary</b>	<b>156</b>

## 5 Chemical reactions



5.1 Energy in chemical reactions	158
Learning Across the Curriculum	
<i>Biofuels</i>	162
5.1 Unit review	163
5.1 Practical investigations	164
5.2 Classifying chemical reactions	167
5.2 Unit review	175
5.2 Practical investigations	176
5.3 Rates of chemical reactions	179
Learning Across the Curriculum	
<i>Enzymes in medicine</i>	184
<b>ADDITIONAL</b>	
5.3 Unit review	186
5.3 Practical investigations	187
5.4 Balancing chemical equations	191
<b>ADDITIONAL</b>	
5.4 Unit review	195
5.4 Practical investigations	196
<b>Chapter review</b>	<b>198</b>
<b>Thinking scientifically</b>	<b>199</b>
<b>Glossary</b>	<b>201</b>

## 6 Global systems



6.1 Earth's spheres	203
6.1 Unit review	209
6.1 Practical investigations	211
6.2 Natural influences on climate	212
6.2 Unit review	218
6.2 Practical investigations	219
6.3 Human influence on climate	221
Learning Across the Curriculum	
<i>Ozone</i>	226
6.3 Unit review	227
6.3 Practical investigations	228
6.4 Changing environments	230
Learning Across the Curriculum	
<i>Reducing carbon dioxide</i>	234
6.4 Unit review	235
6.4 Practical investigations	237
<b>Chapter review</b>	<b>238</b>
<b>Thinking scientifically</b>	<b>239</b>
<b>Glossary</b>	<b>241</b>
<b>Science takes you places—</b>	
<b>Look who is using science</b>	<b>242</b>



## 7 The universe

7.1 Stars	244
Learning Across the Curriculum	
<i>Magellanic Clouds</i>	248
7.1 Unit review	249
7.1 Practical investigations	250
7.2 Colour and magnitude	251
<b>ADDITIONAL</b>	
7.2 Unit review	259
7.2 Practical investigations	260
7.3 Cosmology	262
Learning Across the Curriculum	
<i>Recreating the Big Bang</i>	266
7.3 Unit review	267
7.3 Practical investigations	268
Chapter review	269
Thinking scientifically	270
Glossary	271



## 8 Motion and energy

8.1 Describing motion	274
8.1 Unit review	282
8.1 Practical investigations	284
8.2 Newton's laws of motion	287
8.2 Unit review	292
8.2 Practical investigations	294
8.3 Energy changes	296
8.3 Unit review	300
8.3 Practical investigations	302
8.4 Motion calculations	304
<b>ADDITIONAL</b>	
8.4 Unit review	309
8.4 Practical investigations	311
Chapter review	314
Thinking scientifically	316
Glossary	318



## 9 Forensic science

9.1 Crime scene	320
9.1 Unit review	325
9.1 Practical investigations	327
9.2 Victims and suspects	330
Learning Across the Curriculum	
<i>New poisons</i>	339
9.2 Unit review	341
9.2 Practical investigations	342
9.3 Fakes and extortion	345
9.3 Unit review	350
9.3 Practical investigations	352
Chapter review	354
Thinking scientifically	355
Glossary	356
Index	357