

Contents

<i>List of illustrations</i>	vii
<i>Preface</i>	x
<i>Acknowledgements</i>	xii
<i>List of abbreviations</i>	xiii
 PART I	
Science and Why We Teach It	1
1 What Makes a Good Science Teacher?	3
2 Working Scientifically	10
3 Science Education and Sustainability	23
 PART II	
How Pupils Make Sense of Their World	29
4 Learning through Language and Observation	31
5 Elicitation: Pupils' Ideas of the World	41
6 Constructing Meaning: How Pupils Learn	57
7 Active Learning Techniques	64
8 Learning through Talking	71
9 Learning through Reading	78
10 Learning through Writing	85
11 Harnessing the Power of Computers and the Web	91
12 What if English is Not the Mother Tongue of Your Students?	102
13 Numeracy in Science	106

PART III	
Knowledge and Understanding: Difficult Ideas	115
14 Difficult Ideas in Chemistry	117
15 Difficult Ideas in Physics	136
16 Difficult Ideas in Biology	146
17 Difficult Ideas in Earth Science and Astronomy	158
PART IV	
Planning, Assessment, Teaching and Classroom Management	167
18 Planning for Progression	169
19 Assessment for Learning (AfL)	176
20 Managing Pupils in Science Lessons	184
21 Health, Safety and Laboratory Management	194
22 Teaching and Learning Beyond 16	208
PART V	
Professional Values and the Wider World	213
23 Inclusion and Science for All: 'Every Child Matters'	215
24 Learning Outside the Classroom	226
25 Becoming a Professional Science Teacher	235
<i>References</i>	248
<i>Index</i>	252