

# Contents

Chemistry in the Earth System: A Flow of Ideas	iv
Using This Book	v
Using BIOZONES's Resource Hub	viii
Using the Tab System	x

## IS1 Combustion and Energy Transfer

<i>Student Questions</i>	1
<input type="checkbox"/> 1 <b>ANCHORING PHENOMENON</b>	
Boil 'em in Oil	2
<input type="checkbox"/> 2 Working in the Lab Environment	3
<input type="checkbox"/> 3 Everyday Chemistry	6
<input type="checkbox"/> 4 Observing Reactions	13
<input type="checkbox"/> 5 Energy in Food	15
<input type="checkbox"/> 6 Boil 'em in Oil Revisited	23
<input type="checkbox"/> 7 Summative Assessment	24

## IS2 Heat and Energy in the Earth System

<i>Student Questions</i>	26
<input type="checkbox"/> 8 <b>ANCHORING PHENOMENON</b>	
On the Move	27
<input type="checkbox"/> 9 Energy	28
<input type="checkbox"/> 10 Order and Disorder	34
<input type="checkbox"/> 11 Kinetic Theory of Matter	38
<input type="checkbox"/> 12 Modeling Energy Flow	42
<input type="checkbox"/> 13 Energy in the Earth	48
<input type="checkbox"/> 14 Evidence for Earth's Structure	52
<input type="checkbox"/> 15 Energy Drives Plate Tectonics	60
<input type="checkbox"/> 16 On the Move Revisited	69
<input type="checkbox"/> 17 Summative Assessment	70

## IS3 Atoms, Elements, and Molecules

<i>Student Questions</i>	74
<input type="checkbox"/> 18 <b>ANCHORING PHENOMENON</b>	
Burp!	75
<input type="checkbox"/> 19 Properties and Patterns	76
<input type="checkbox"/> 20 The Atom	80
<input type="checkbox"/> 21 The Periodic Table	88
<input type="checkbox"/> 22 The Mole	95
<input type="checkbox"/> 23 Aqueous Reactions	108
<input type="checkbox"/> 24 Burp! Revisited	113
<input type="checkbox"/> 25 Summative Assessment	114

## IS4 Chemical Reactions

<i>Student Questions</i>	118
<input type="checkbox"/> 26 <b>ANCHORING PHENOMENON</b>	
Hot! Too Hot!	119
<input type="checkbox"/> 27 Molecular Structure	120
<input type="checkbox"/> 28 Properties of Matter	125
<input type="checkbox"/> 29 Energy and Changes of State	135
<input type="checkbox"/> 30 Energy in Chemical Reactions	137
<input type="checkbox"/> 31 Reaction Rates	147

<input type="checkbox"/> 32 Hot! Too Hot! Revisited	152
<input type="checkbox"/> 33 Summative Assessment	153

## IS5 Chemistry of Climate Change

<i>Student Questions</i>	157
<input type="checkbox"/> 34 <b>ANCHORING PHENOMENON</b>	
It's Heating Up	158
<input type="checkbox"/> 35 Combustion and Hydrocarbons	159
<input type="checkbox"/> 36 Fuels and People	162
<input type="checkbox"/> 37 Atmospheric Chemistry	170
<input type="checkbox"/> 38 Global Warming and Climate Change	176
<input type="checkbox"/> 39 Soil Chemistry and Its Role in Climate Change	185
<input type="checkbox"/> 40 Living with Limited Resources	191
<input type="checkbox"/> 41 It's Heating Up Revisited	194
<input type="checkbox"/> 42 Summative Assessment	195

## IS6 The Dynamics of Chemical Reactions and Ocean Acidification

<i>Student Questions</i>	199
<input type="checkbox"/> 43 <b>ANCHORING PHENOMENON</b>	
Seashells by the Seashore	200
<input type="checkbox"/> 44 Reversible Reactions	201
<input type="checkbox"/> 45 Industrial Chemistry	208
<input type="checkbox"/> 46 Ocean Chemistry	212
<input type="checkbox"/> 47 Seashells by the Seashore Revisited	224
<input type="checkbox"/> 48 Summative Assessment	225

## Basic Skills for Chemistry Students

<i>Student Questions</i>	228
<input type="checkbox"/> 49 The Nature of Science	229
<input type="checkbox"/> 50 Systems and System Models	231
<input type="checkbox"/> 51 Observations and Assumptions	233
<input type="checkbox"/> 52 Useful Concepts in Chemistry	235
<input type="checkbox"/> 53 Standard Chemistry Equipment	237
<input type="checkbox"/> 54 Experimenting in Chemistry	238
<input type="checkbox"/> 55 Accuracy and Precision	239
<input type="checkbox"/> 56 Measurement and Quantitative Analysis	240
<input type="checkbox"/> 57 Working With Numbers	242
<input type="checkbox"/> 58 Ratio and Proportion in Chemistry	243
<input type="checkbox"/> 59 Logbooks and Tables	245
<input type="checkbox"/> 60 Drawing and Interpreting Graphs	246
<input type="checkbox"/> 61 Describing the Data	248
<input type="checkbox"/> 62 Periodic Table	250

Appendix: Equipment List	251
Image Credits	252
Index	253