

# Contents

<i>About the series</i>		xiii
<i>Contributors</i>		xiv
<i>Preface</i>		xviii
<i>Acknowledgements</i>		xxi
<i>How to use your textbook</i>		xxii
<i>About the companion website</i>		xxvi
<b>Chapter 1</b>	<b>The child in society: enhancing health and wellbeing</b>	<b>1</b>
	<i>Lisa Whiting and Mary Donnelly</i>	
	Aim	1
	Introduction	2
	The concept of childhood	3
	The child's 'voice'	4
	Fundamental aspects of children's lives	4
	Children's health and wellbeing	7
	Child public health	8
	Promoting child health: the role of the children's nurse	10
	Morbidity and mortality	11
	Conclusion	12
	Glossary	12
	References	13
<b>Chapter 2</b>	<b>Homeostasis</b>	<b>17</b>
	<i>Mary Brady</i>	
	Aim	17
	Introduction	18
	Regulation of homeostasis	18
	Homeostatic mechanisms	19
	Energy production	20
	Systematic approach to homeostasis	22
	Thermoregulation	30
	Conclusion	33
	Activities	33
	Glossary	37
	References	39
<b>Chapter 3</b>	<b>Scientific principles</b>	<b>40</b>
	<i>Peter S. Vickers</i>	
	Aim	40
	Introduction	41

Levels of organization	41
Characteristics of life	41
Bodily requirements	43
Atoms	43
Units of measurement	54
Conclusion	54
Activities	57
Glossary	59
References	61
<b>Chapter 4 The cell</b>	<b>62</b>
<i>Peter S. Vickers</i>	
Aim	62
Introduction	63
Characteristics of the cell	63
The structure of the cell	65
The organelles	73
Fluids and the body	78
Conclusion	83
Activities	84
Glossary	86
References	87
<b>Chapter 5 Genetics</b>	<b>89</b>
<i>Peter S. Vickers</i>	
Aim	89
Introduction	90
Genes	90
From DNA to proteins	94
The transference of genes	99
Mendelian genetics	104
Conclusion	111
Activities	111
Glossary	114
References	117
<b>Chapter 6 Tissues</b>	<b>118</b>
<i>Peter S. Vickers</i>	
Aim	118
Introduction	119
Types of tissues	120
Tissue repair	132
Children and tissue development	134
Conclusion	135
Activities	135
Glossary	137
References	139

<b>Chapter 7 The immune system</b>	<b>140</b>
<i>Alison Mosenthal</i>	
Aim	140
Introduction	141
Blood cell development	141
The organs and tissues of the immune system	142
Types of immunity	148
Immunoglobulins (antibodies)	156
Actions of antibodies	159
Immunizations	160
Conclusion	163
Activities	163
Glossary	165
References	166
<b>Chapter 8 Blood</b>	<b>167</b>
<i>Peter S. Vickers</i>	
Aim	
Introduction	167
Composition of blood	168
Functions of blood	168
Constituents of blood	170
Blood vessels	172
Structure and function of blood vessels	183
Conclusion	184
Activities	190
Glossary	190
References	193
	194
<b>Chapter 9 The cardiac system</b>	<b>196</b>
<i>Sheila Roberts</i>	
Aim	
Body map	196
Introduction	197
Fetal circulation	197
Changes at birth	197
Position and size of the heart	198
Structures of the heart	200
The electrical pathway through the heart	201
Electrocardiogram	205
The cardiac cycle	206
Cardiac output	207
Factors affecting the heart rate	209
Conclusion	210
Conditions to consider in relation to the cardiac system	210
Activities	211
Glossary	211
References	213
	215



**Chapter 10 The respiratory system**

*Elizabeth Akers*

- Aim
- Body map
- Introduction
- The airway
- The lungs
- Conclusion
- Activities
- Glossary
- References

**Chapter 11 The endocrine system**

*Julia Petty*

- Aim
- Introduction
- Physiology of the endocrine system
- Anatomy of the endocrine system
- Conclusion
- Activities
- Glossary
- References

**Chapter 12 The digestive system and nutrition**

*Joanne Outteridge*

- Aim
- Body map
- Introduction
- Fetal development and infant nutrition
- The anatomy and physiology
- Conclusion
- Activities
- Glossary
- References

**Chapter 13 The renal system**

*Elizabeth Gormley-Fleming*

- Aim
- Introduction
- The renal system
- The kidney
- Functions of the kidney
- Blood supply to the kidneys
- Formation of urine
- Composition of urine
- The ureters
- The bladder
- The urethra

**216**

216  
217  
217  
218  
224  
230  
230  
231  
232

**233**

233  
234  
235  
238  
252  
252  
253  
254

**256**

256  
258  
258  
263  
266  
278  
278  
280  
280

**282**

282  
283  
283  
284  
291  
291  
292  
295  
297  
297  
298

Function of the bladder and micturition	300
Conclusion	301
Activities	301
Glossary	303
References	304
<b>Chapter 14 The reproductive systems</b>	<b>305</b>
<i>Ann L. Bevan</i>	
Aim	305
Introduction	306
Fetal embryology: sexual differentiation	306
The male reproductive system	308
The female reproductive system	317
Conclusion	329
Activities	330
Glossary	331
References	333
<b>Chapter 15 The nervous system</b>	<b>335</b>
<i>Petra Brown</i>	
Aim	335
Introduction	336
Organization of the nervous system	336
Cellular structure of the nervous system	337
Transmission of nerve impulses	340
Fetal development	342
Childhood development	342
Central nervous system	344
Peripheral nervous system	352
Conclusion	361
'Did you know' information	361
Activities	361
Glossary	363
References	365
<b>Chapter 16 The muscular system</b>	<b>366</b>
<i>Elizabeth Gormley-Fleming</i>	
Aim	366
Introduction	367
Muscle development in early life	367
Types of muscle tissue	367
Function of musculature system	369
Gross anatomy of skeletal muscle	371
The micro-anatomy of the muscle	372
Types of muscle fibres	374
Skeletal muscle relaxation and contraction	375
Energy requirements for muscle contraction	377

	Organization of skeletal muscle	378
	Conclusion	393
	Activities	399
	Glossary	401
	References	401
<b>Chapter 17</b>	<b>The skeletal system</b>	<b>403</b>
	<i>Debbie Martin</i>	
	Aim	403
	Body map	404
	Introduction	404
	The function of the skeleton	405
	Bone structure and growth	408
	Bone healing	413
	Bone classification	415
	Joints	418
	Conclusion	419
	Activities	424
	Glossary	425
	References	427
<b>Chapter 18</b>	<b>The senses</b>	<b>428</b>
	<i>Joanne Outteridge</i>	
	Aim	428
	Introduction	429
	The sense of smell (olfaction)	429
	The sense of taste (gustation)	430
	The ear	432
	Sight	437
	Conclusion	441
	Activities	441
	Glossary	442
	References	443
<b>Chapter 19</b>	<b>The skin</b>	<b>444</b>
	<i>Elizabeth Gormley-Fleming</i>	
	Aim	444
	Introduction	445
	The structure of skin	446
	Functions of the skin	455
	Conclusion	460
	Activities	460
	Glossary	463
	References	464
	<i>Self-assessment answers</i>	466
	<i>Index</i>	489