

Contents

CELL BIOLOGY

Eukaryotes and prokaryotes	8
Animal and plant cells	9
Cell specialisation and differentiation	10
Microscopy	11
Culturing microorganisms	12
Using a light microscope	13
Investigating the effect of antiseptics or antibiotics	14
Mitosis and the cell cycle	15
Stem cells	16
Diffusion	17
Osmosis	18
Investigating the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue	19
Active transport	20

Topic 1

TISSUES, ORGANS AND ORGAN SYSTEMS

The human digestive system and enzymes	21
Food tests	23
The effect of pH on amylase	24
The heart	25
The lungs	26
Blood vessels and blood	27
Coronary heart disease	28
Health issues and effect of lifestyle	29
Cancer	30
Plant tissues	31
Transpiration and translocation	32

Topic 2

INFECTION AND RESPONSE

Communicable (infectious) diseases	33
Viral and bacterial diseases	34
Fungal and protist diseases	35
Human defence systems	36
Vaccination	37
Antibiotics and painkillers	38
New drugs	39
Monoclonal antibodies and their uses	40
Plant diseases and defences	41

Topic 3

BIOENERGETICS

Photosynthesis	42
Rate of photosynthesis	43
Investigating the effect of light intensity on the rate of photosynthesis	44
Uses of glucose	45
Respiration and metabolism	46
Response to exercise	47

Topic 4

HOMEOSTASIS AND RESPONSE

Homeostasis	48
The human nervous system and reflexes	49
Investigating the effect of a factor on human reaction time	50
The brain and the eye	51
Focusing the eye	52
Control of body temperature	53
Human endocrine system	54
Control of blood glucose concentration	55

Topic 5

Diabetes	56
Maintaining water and nitrogen balance in the body	57
Dialysis	58
Hormones in human reproduction	59
Contraception	60
Using hormones to treat infertility	61
Negative feedback	62
Plant hormones	63
Investigating the effect of light or gravity on the growth of newly germinated seedlings	64

Topic 6

INHERITANCE, VARIATION AND EVOLUTION

Sexual and asexual reproduction	65
Meiosis	66
DNA and the genome	67
DNA structure	68
Protein synthesis	69
Genetic inheritance	70
Inherited disorders	71
Variation	72
Evolution	73
Selective breeding	74
Genetic engineering and cloning	75
Evolution and speciation	76
The understanding of genetics	77
Classification	78

Topic 7

ECOLOGY

Communities	79
Abiotic and biotic factors	80
Adaptations	82
Food chains	83
Measuring species	84
Investigating the relationship between organisms and their environment	85
The carbon cycle, nitrogen cycle and water cycle	86
Decomposition	87
Investigating the effect of temperature on the rate of decay	88
Impact of environmental change	89
Biodiversity	90
Global warming	91
Maintaining biodiversity	92
Trophic levels and pyramids of biomass	93
Food production and biotechnology	94

PAPER 1

95

ANSWERS

104