|  |  |  |
| --- | --- | --- |
| **Paddington Academy Topic Overview**  **Subject: Biology**  **Exam Board: OCR A** | | |
| **Topic** | **Sub-Topics** | **Textbook/Revision Guide Pages** |
| Practical skills | Planning an experiment | 5-8 |
| Carrying out an experiment | 9-10 |
| Processing data | 11-16 |
| Presenting data | 17-22 |
| Drawing conclusions and evaluating | 23-28 |
| Cell Structure | Cells and Organelles | 30-37 |
| Prokaryotic cells | 38-39 |
| Microscopes | 40-48 |
| Biological molecules | Water | 51-53 |
| Carbohydrates | 54-57 |
| Lipids | 58-60 |
| Proteins | 61-65 |
| Inorganic ions | 66-67 |
| Biochemical tests | 68-73 |
| Separating molecules | 74-77 |
| Nucleotides and nucleic acids | Nucleotides | 80-82 |
| DNA | 83-85 |
| DNA replication | 86-87 |
| Protein synthesis | 88-94 |
| Enzymes | Action of enzymes | 97-100 |
| Factors affecting enzymes | 101-103 |
| Enzyme-controlled reactions | 104-107 |
| Cofactors and enzyme inhibition | 108-113 |
| Biological membranes | Cell membrane structure | 116-121 |
| Signalling | 122-123 |
| Diffusion and osmosis | 124-130 |
| Facilitated diffusion and active transport | 131-136 |
| Cell division and cellular organisation | The cell cycle and mitosis | 139-142 |
| Sexual reproduction and meiosis | 143-146 |
| Stem cells and differentiation | 147-151 |
| Tissues, organs and systems | 152-155 |
| Exchange and transport | Specialised exchange systems | 158-162 |
| Gas exchange in mammals | 163-165 |
| Ventilation in mammals | 166-168 |
| Gas exchange in fish and insects | 169-171 |
| Dissecting gas exchange systems | 172-174 |
| Transport in animals | Circulatory systems | 177-179 |
| Blood vessels | 180-182 |
| The heart | 183-186 |
| Electrical activity of the heart | 187-190 |
| Haemoglobin | 191-195 |
| Transport in plants | Xylem and phloem | 198-202 |
| Water transport | 203-205 |
| Transpiration | 206-209 |
| Translocation | 210-213 |
| Disease and the immune system | Pathogens and communicable disease | 216-218 |
| Defence against pathogens | 219-221 |
| The immune system | 222-225 |
| Antibodies | 226-227 |
| Primary and secondary immune responses | 228-229 |
| Immunity and vaccination | 230-233 |
| Antibiotics and other medicines | 234-237 |
| Biodiversity | Investigating biodiversity | 240-245 |
| Genetic diversity | 246-247 |
| Factors affecting biodiversity | 248-250 |
| Biodiversity and conservation | 251-257 |
| Classification and evolution | Classification systems | 260-266 |
| Variation | 267-269 |
| Investigating variation | 270-275 |
| Adaptations | 276-278 |
| The theory of evolution | 279-284 |
| Communication and homeostasis | Communication basics | 14 |
| The nervous system | 15-18 |
| The nervous impulse | 19-23 |
| Synapses | 24-27 |
| The hormonal system | 30-33 |
| Homeostasis basics | 34-36 |
| Control of body temperature | 37-40 |
| Control of blood glucose concentration | 41-46 |
| Excretion | The liver | 51-55 |
| The kidneys | 56-60 |
| Water potential | 61-63 |
| Kidney failure | 64-66 |
| Detecting chemicals | 67-69 |
| Animal responses | The nervous system | 72-75 |
| Fight or flight | 76-81 |
| Muscle contraction | 82-89 |
| Nerve impulses and muscle contraction | 90-93 |
| Plant responses and hormones | Plant responses | 96-101 |
| The effect of plant hormones | 102-107 |
| Photosynthesis | Energy | 110-112 |
| The light-dependent reaction | 113-117 |
| The light-independent reaction | 118-120 |
| Limiting factors | 121-125 |
| Investigations into photosynthesis | 126-129 |
| Respiration | Aerobic respiration | 132-138 |
| Anaerobic respiration | 139-140 |
| Respiratory substrates | 141-142 |
| Investigations into respiration | 143-147 |
| Cellular control | Regulating gene expression | 150-153 |
| Body plans | 154-156 |
| Mutations | 157-160 |
| Patterns of inheritance | Types and causes of variation | 162-164 |
| Genetic terms | 165-166 |
| Monogenic crosses | 167-170 |
| Multiple alleles and dihybrid crosses | 171-173 |
| Linkage | 174-178 |
| Epistasis | 179-181 |
| The Chi-squared test | 182-187 |
| Evolution | Natural selection and genetic drift | 190-194 |
| The Hardy-Weinberg Principle | 195-197 |
| Artificial selection | 198-199 |
| Speciation | 200-203 |
| Manipulating genomes | Common techniques | 206-210 |
| DNA profiling | 211 |
| Genetic engineering | 212-213 |
| Genetically modified organisms | 214-217 |
| Gene therapy | 218-219 |
| Sequencing genes and genomes | 220-227 |
| Cloning and biotechnology | Plant cloning | 230-233 |
| Animal cloning | 234-237 |
| The uses of microorganisms | 238-241 |
| Culturing microorganisms | 242-248 |
| Immobilised enzymes | 249-252 |
| Ecosystems | Energy flow | 255-261 |
| Recycling | 262-264 |
| Succession | 265-268 |
| Investigating ecosystems | 269-273 |
| Populations and sustainability | Variation in population size | 276-279 |
| Conservation of ecosystems | 280-283 |
| Human impact on ecosystems | 284-287 |