**AQA GCSE Biology, and Combined Science – Biology topics, Grade 5 Booster workbook**

***Grey shading indicates Biology only***

|  |  |  |  |
| --- | --- | --- | --- |
| **Section** | **Topic** | **Page No.** | **Single science specification reference** |
| **1 Cell biology** | Plant and animal cells (eukaryotic cells) | 4-5 | 4.1.1.1 and 4.1.1.2 (cell parts); Required practical activity 1 |
| Bacterial cells (prokaryotic cells) | 5-6 | 4.1.1.1 |
| Size of cells and cell parts | 6-7 | 4.1.1.1, the parts on size/scale, standard form, calculations; also magnification from 4.1.1.5 |
| The electron microscope | 8 | 4.1.1.5 |
| Growing microoorganisms | 8-10 | 4.1.1.6; Required practical activity 2 (Biology only) |
| Cell specialisation and differentiation | 10-11 | 4.1.1.3, 4.1.1.4 |
| Cell division by mitosis | 11-12 | 4.1.2.1 and 4.1.2.2 |
| Stem cells | 12-13 | 4.1.2.3 |
| Diffusion | 14-15 | 4.1.3.1 (first half) |
| Exchange surfaces in animals | 15 | 4.1.3.1 (second half, including SA/vol calculations) |
| Osmosis | 17 | 4.1.3.2; Required practical activity 3 |
| Active transport | 19 | 4.1.3.3 |
| **2 Organisation** | Digestive system | 20 | 4.2.1, 4.2.2.1 (structure, not enzymes). Also includes aspects of metabolism from 4.4.2.3 |
| Digestive enzymes | 21-22 | part of 4.2.2.1; Required practical activity 4 |
| Factors affecting enzymes | 22-23 | part of 4.2.2.1 relating to rates; Required practical activity 5 |
| Heart and blood vessels | 23-24 | 4.2.2.2 (part) |
| Blood | 25-26 | 4.2.2.3 |
| Heart-lungs system | 26 | 4.2.2.2 (remainder) |
| Coronary heart disease | 27-28 | 4.2.2.4, including part of 4.2.2.5 |
| Risk factors for non-infectious diseases | 29-30 | 4.2.2.6, including part of 4.2.2.5 |
| Cancer | 31 | 4.2.2.7, including part of 4.2.2.5 |
| Leaves as plant organs | 32-33 | 4.2.3.1 |
| Transpiration | 33-34 | 4.2.3.2 (part) |
| Translocation | 34-35 | 4.2.3.2 (remainder) |
| **3 Infection and response** | Microorganisms and disease | 36 | 4.3.1.1, including part of 4.2.2.5 |
| Viral diseases | 37 | 4.3.1.2 |
| Bacterial diseases | 37-38 | 4.3.1.3, including part of 4.2.2.5 |
| Malaria | 38-39 | 4.3.1.5 |
| Human defence systems | 40 | 4.3.1.6 |
| Vaccination | 41-42 | 4.3.1.7, including part of 4.2.2.5 |
| Antibiotics and painkillers | 42-43 | 4.3.1.8 |
| Making and testing new drugs | 43-44 | 4.3.1.9 |
| Monoclonal antibodies | 44-45 | 4.3.2 (Biology only) |
| Plant fungal diseases | 46-47 | 4.3.1.4, plus Higher tier parts from 4.3.3.1 (this part Biology only) |
| Other plant diseases | 47-48 | part of 4.3.3.1 (Biology only) |
| Plant defence responses | 49-50 | 4.3.3.2 (Biology only) |
| **4 Photosynthesis and respiration reactions** | Photosynthesis reaction | 51 | 4.4.1.1 |
| Rate of photosynthesis | 52-53 | 4.4.1.2; Required practical activity 6 |
| Limiting factors | 54-55 | Higher tier only part of 4.4.1.2 on limiting factors |
| Uses of glucose from photosynthesis | 55-56 | 4.4.1.3 |
| Cell respiration | 57-58 | 4.4.2.1, part on aerobic respiration, plus aspects of metabolism from 4.4.2.3 |
| Anaerobic respiration | 58-59 | 4.4.2.1, part on anaerobic respiration |
| Response to exercise | 59-60 | 4.4.2.2 |
| **5 Automatic control systems in the body** | Homeostasis | 61 | 4.5.1 |
| The nervous system and reflexes | 62-63 | 4.5.2.1; Required practical activity 7 |
| The brain | 64 | 4.5.2.2 (Biology only) |
| The eye | 65 | 4.5.2.3 (Biology only) |
| Seeing in focus | 66-67 | 4.5.2.3 (Biology only) |
| Control of body temperature | 68-69 | 4.5.2.4 (Biology only) |
| Hormones and the endrocrine system | 69-70 | 4.5.3.1 |
| Controlling blood glucose | 71 | 4.5.3.2 |
| Maintaining water balance in the body | 72-73 | 4.5.3.3 (Biology only) plus aspects of metabolism from 4.4.2.3 |
| Water and nitrogen balance in the body | 73-74 | 4.5.3.3 (Biology only) Higher tier parts |
| Hormones in human reproduction | 74 | 4.5.3.4 |
| Hormones interacting in human reproduction | 75-76 | 4.5.3.4 Higher tier parts |
| Contraception | 76-78 | 4.5.3.5 |
| Using hormones to treat infertility | 78-79 | 4.5.3.6 |
| Negative feedback | 79-80 | 4.5.3.7 |
| Plant hormones | 81-82 | 4.5.4.1; Required practical activity 8 (Biology only) |
| Plant hormones and their uses | 83-84 | 4.5.4.2 (Biology only) |
| **6 Inheritance, variation and evolution** | Sexual reproduction and fertilisation | 85 | 4.6.1.1 |
| Asexual reproduction | 86 | 4.6.1.1 |
| Cell division by meiosis | 87 | 4.6.1.2 |
| Comparing sexual and asexual reproduction | 88 | 4.6.1.3 (Biology only) |
| DNA, genes and the genome | 89 | 4.6.1.4 |
| Structure of DNA | 90 | 4.6.1.5 (part) (Biology only) |
| Protein synthesis and mutations | 91 | 4.6.1.5 (remainder) (Biology only) |
| Inherited characteristics | 92-93 | 4.6.1.6 |
| Inherited disorders | 94-95 | 4.6.1.7 |
| Sex chromosomes | 96 | 4.6.1.8 |
| Variation | 97-98 | 4.6.2.1 |
| Evolution by natural selection | 98-100 | 4.6.2.2 |
| Darwin and Wallace | 100-101 | 4.6.3.1 and parts of 4.6.3.2 (both Biology only) |
| Speciation | 101-103 | 4.6.3.2 (Biology only) |
| Modern understanding of genetics | 103-104 | 4.6.3.3 (Biology only) |
| Fossil evidence for evolution | 105 | 4.6.3.5 and 4.6.3.4 (part) |
| Other evidence for evolution | 106-107 | 4.6.3.4 (the part on antibiotic resistance), 4.6.3.7 |
| Extinction | 108 | 4.6.3.6 |
| Selective breeding | 109-110 | 4.6.2.3 |
| Genetic engineering | 111-112 | 4.6.2.4 |
| Cloning | 112-113 | 4.6.2.5 (Biology only) |
| Classification of living organisms | 114-115 | 4.6.4 |
| **7 Ecology** | Habitats and ecosystems | 116-117 | 4.7.1.1 (definitions of community, habitat, ecosystem, population, general idea of interdependence and stable community) |
| Food in an ecosystem | 117 | 4.7.2.1 (part) |
| Biotic and abiotic factors | 118-119 | 4.7.1.2 (part), 4.7.1.3, plus predator-prey cycles from 4.7.2.1 |
| Adapting for survival | 120-121 | 4.7.1.4 |
| Measuring population size and species distribution | 121-122 | 4.7.2.1 (part); Required practical 9 |
| Cycling materials | 122-124 | 4.7.2.2 |
| Decomposition | 124-125 | 4.7.2.3; Required practical activity 10 (Biology only) |
| Changing the environment | 126 | 4.7.2.4 (Biology only) |
| Effects of human activities | 127-128 | 4.7.3.2 and 4.7.3.3 and 4.7.3.4, plus definition and importance of biodiversity from 4.7.3.1 |
| Global warming | 129-130 | 4.7.3.5 |
| Maintaining biodiversity | 130-131 | 4.7.3.6 |
| Biomass in an ecosystem | 132-133 | 4.7.4.2 and 4.7.4.3 (both Biology only) |
| Food security | 134-135 | 4.7.5.1 and 4.7.5.2 and 4.7.5.3 (all Biology only) |
| Role of biotechnology | 135-136 | 4.7.5.4 (Biology only) |