

AQA Biology Course Guide

Candidates taking the AQA AS biology course must complete all of all of Units 1-3 Unit (left column). Units 4-6 (right column) are completed in the A2 year. The entire AS and A2 course is outlined

here, with the corresponding chapters in BIOZONE's AS and A2 workbooks indicated.

AS Content		Topics in AQA-AS Workbook	A2 Content		Topics in AQA-A2 Workbook
Unit 1: Biology and Disease			Unit 4: Populations and Environment		
1.1	Pathogens, diseases caused by pathogens, lifestyle factors and disease.	The Causes of Disease	4.1	Populations and ecosystems. Habitat and niche. Population sampling methods.	Investigating Populations
1.2	The human digestive system, carbohydrate and protein digestion, condensation and hydrolysis reactions, enzymes and enzyme activity, biochemical food tests.	Macromolecules and Human Digestion		Variation in population size as a result of abiotic and biotic factors (predatory-prey, competition). Human populations, natality, mortality, survivorship, life expectancy.	Population Dynamics
1.3	Prokaryote and eukaryote cell structure, organelles, microscopy, cell fractionation. Plasma membranes, membrane transport. Cholera and membrane permeability, oral rehydration solutions.	Cell Structure and Function	4.2	ATP synthesis from ADP and phosphate. Central role of ATP in biological processes.	Photosynthesis and Cellular Respiration
1.4	Structure and function of the human respiratory system, gas exchange surfaces, lung disease (TB, smoking related disease).	Processes across Exchange Surface	4.3	Photosynthesis: light dependent reactions, light independent reactions, limiting factors.	Photosynthesis and Cellular Respiration
1.5	Structure and function of the human heart, cardiac cycle and control, coronary heart disease and risk factors. Blood vessels.	Gas Exchange at the Lung	4.4	Cellular respiration: glycolysis, the Krebs cycle, oxidative phosphorylation. Anaerobic pathways (fermentation).	Photosynthesis and Cellular Respiration
1.6	Immune response, phagocytosis, antigens and antibodies, humoral and cellular responses, antigenic variability, vaccines, monoclonal antibodies	The Human Heart	4.5	Transfer of energy through ecosystems: trophic relationships, energy efficiencies, and ecological pyramids. Energy and food production: natural vs intensive systems.	Energy in Ecosystems
		Adaptation and Specialisation	4.6	Biogeochemical cycles: carbon and nitrogen cycles and human intervention in cycles.	Nutrient Cycles
		Blood and Immunology	4.7	Ecological succession. Succession and conservation of managed habitats.	Succession in Ecosystems
			4.8	Genetic variation and change: alleles, inheritance, crosses involving multiple alleles and sex linkage. Gene pools and the Hardy-Weinberg principle. Natural selection, isolation, and speciation	The Genetics of Populations
Unit 2: The Variety of Living Organisms			Unit 5: Control in Cells and Organisms		
2.1	Species variation, causes of variation. Distribution, mean and standard deviation.	Variation Skills in Biology	5.1	Response to stimuli: tropisms, taxes, kinesis, reflexes. The autonomic nervous system and control of heart rate. Sensory receptors: the Pacinian corpuscle and the retina.	Stimuli and Responses
2.2	Structure and function of DNA, genes the genetic code, amino acid coding, eukaryotic and prokaryotic chromosomes, meiosis.	The Role of DNA	5.2	Chemical and electrical coordination: hormones, plant growth regulators, nerves, nerve impulse transmission, and synapses.	Mechanisms of Coordination
2.3	Genetic diversity, selective breeding, the founder effect, genetic bottlenecks.	Variety and Complexity	5.3	Skeletal muscle structure and function. Energy sources for muscle contraction.	Muscles and Movement
2.4	Biochemical diversity, haemoglobin structure and function, oxygen dissociation curves, effects of carbon dioxide. Plant cell structure and organelles. Carbohydrate structure and function.	Biochemical and Cellular Diversity	5.4	Homeostasis: thermoregulation, cell signalling, control of blood glucose, diabetes mellitus.	Homeostasis
2.5	DNA replication, mitosis and the cell cycle, cancer and the cell cycle.	Macromolecules and Human Digestion	5.5	Negative and positive feedback mechanisms as shown in the mammalian oestrous cycle.	Homeostasis
2.6	Cellular specialisation and organisation, plant and animal tissues, cell differentiation.	Biochemical and Cellular Diversity	5.6	DNA, the genetic code, and the structure of proteins. Gene expression: transcription, translation. Gene mutation and oncogenes.	DNA and Gene Expression
2.7	Exchange surfaces, SA:V ratio, animal and plant gas exchange systems, xerophytes. Mammalian circulatory system, structure and function of blood vessels, lymphatic system and tissue fluid. Plant transport system, structure and function of dicot roots, transpiration, translocation.	Biochemical and Cellular Diversity	5.7	Control of gene expression: totipotency in plants. Stem cells in animals. Stem cell therapy. Regulation of gene expression.	DNA and Gene Expression
2.8	Classification, principles of taxonomy.	Adaptation and Specialisation	5.8	Gene cloning and transfer: reverse transcription, use of restriction enzymes, use of PCR. In vivo and in vitro gene cloning. Producing transformed organisms of use to humans. Ethical issues of gene technologies. Gene therapy. DNA sequencing and medical diagnosis. Genetic fingerprinting and its applications.	Gene Cloning Technologies
2.9	Genetic evidence for classification, DNA hybridisation, immunological evidence, protein comparisons, courtship behaviour.	Classification and Evidence of Phylogeny			
2.10	Antibiotic resistance, evolution in bacteria, gene transmission.	Classification and Evidence of Phylogeny			
2.11	Biodiversity, measuring biodiversity, effects of deforestation and agriculture on diversity.	Evolution and Biodiversity			
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Unit 3: Investigative and Practical Skills in AS Biology			Unit 6: Investigative and Practical Skills in A2 Biology		
3.1 - 3.4	Assessment of planning and implementation of practical work, collection and presentation of raw data, data analysis and evaluation, ability to select and retrieve information and communication skills.	Skills in Biology	6.1 - 6.4	Practical work involving collection and analysis of ecological data. Selecting using and interpreting a statistical test: e.g. standard error and 95% CL, or Chi squared. Identify and evaluate limitations in procedures.	Investigative and Practical Skills in A2 Biology Investigating Populations Teacher Resource CD-ROM

