

Archbishop Beck Catholic College Long Term Plan for Biology

Year 12

Autumn Half Term 1	Half Term 2	Key Vocabulary/Reading Opportunities
<p>Topic Areas to be covered:</p> <p><u>Section 3.1</u> <u>Biological molecules:</u> Introduction to Biological molecules, carbohydrates, lipids, proteins</p> <p><u>Section 3.2</u> <u>Cell structure</u> Studying cells - including microscopy Eukaryotic structure & function Prokaryotic structure & function Viruses Mitosis & cell cycle Cell division in prokaryotes Replication of viruses Cancer</p> <p><u>AP1 Assessment</u></p>	<p>Topic Areas to be covered:</p> <p><u>Section 3.1</u> <u>Biological Molecules</u> Enzyme action, enzyme inhibition, structure of RNA and DNA, ATP, Water</p> <p><i>Required Practical 1</i> Effect of a factor on rate of enzyme controlled reaction</p> <p><i>Required Practical 2</i> Preparation of cell squash.</p> <p><u>Section 3.2</u> <u>Transport across cell membranes</u> Structure of cell surface membrane.</p> <p><i>Required Practical 4</i> Factors affecting the permeability of membranes (beetroot)</p> <p>Diffusion, osmosis, active transport - including absorption of glucose.</p> <p><i>Required Practical 3</i> Osmosis</p> <p><u>AP 2 Assessment</u></p>	<p><u>Section 3.1 Biological Molecules</u></p> <p>Monomer, saccharide, condensation, hydrolysis, lipid, triglyceride, phospholipid, amino acid, quaternary, enzyme, rate of reaction, inhibition, active site, induced fit</p> <p><u>Section 3.2 Cell structure</u></p> <p>Organelles, resolution, milli, micro and nano as prefixes of units of measurement, differentiated, structures involved in cell cycle, equator, poles, chromosomes, chromatids, binary fission, homologous chromosomes, haploid, diploid</p>

Spring Half Term 3	Half Term 4	Key Vocabulary/Reading Opportunities
<p><u>Section 3.3</u> <u>Organisms Exchange substances with their environment:</u> Surface area to volume ratio, gas exchange in single celled organisms, insects, fish and plants, limiting water loss in plants ,Human gas exchange, breathing and structure of lungs,</p> <p><u>Section3.2</u> <u>Cells: Cell recognition & the immune system</u> Defence mechanisms: phagocytosis, cell mediated & humoral. Vaccination HIV Section</p> <p><u>3.4 Genetic information, variation and relationships between organisms.</u> <u>DNA, genes & protein synthesis</u> Genetic code & chromosome structure RNA structure Transcription Translation</p>	<p><u>Section 3.3</u> <u>Organisms Exchange substances with their environment:</u> Enzymes and digestion, absorption, Section, Mass transport: haemoglobin, circulatory system, heart, cardiac cycle, blood vessels</p> <p><u>Required practical 5</u></p> <p><u>Section 3.4</u> <u>Genetic Information, variation and relationships between organisms.</u> Mutations & meiosis as sources of variationAdaptation & types of selection</p> <p><u>Required practical 6</u></p> <p>Biodiversity Taxonomy Diversity within communities Human activity Investigating diversity and variation</p> <p><u>AP3 Assessment</u></p>	<p><u>Section 3.3 Organisms Exchange substances with their environment:</u> Diffusion, osmosis, active transport, diffusion gradient, tracheoles, lamellae, countercurrent flow, stomata, spiracles, xerophyte, trachea, bronchi. Bronchioles, alveoli, inspiration, expiration, ileum, micelle, emulsification, peptidases, haemoglobin, diastole, systole, cardiac output, tissue fluid.</p> <p><u>Section 3.4 Genetic information, variation and relationships between organisms.</u> <u>DNA, genes & protein synthesis</u> Locus, triplet, base pairing, adenine, guanine, cytosine, thymine, uracil, degenerate, universal, non-overlapping, exons, introns, splicing, spliceosome, chromatid, histones, codons, anticodons, ribonucleic acid, mRNA (pre & mature). tRNA, hydrogen bonds, nucleotide, complementary, RNA polymerase</p>
Summer Half Term 5	Half Term 6	Key Vocabulary/Reading Opportunities

Section 3.3

Organisms Exchange substances with their environment:

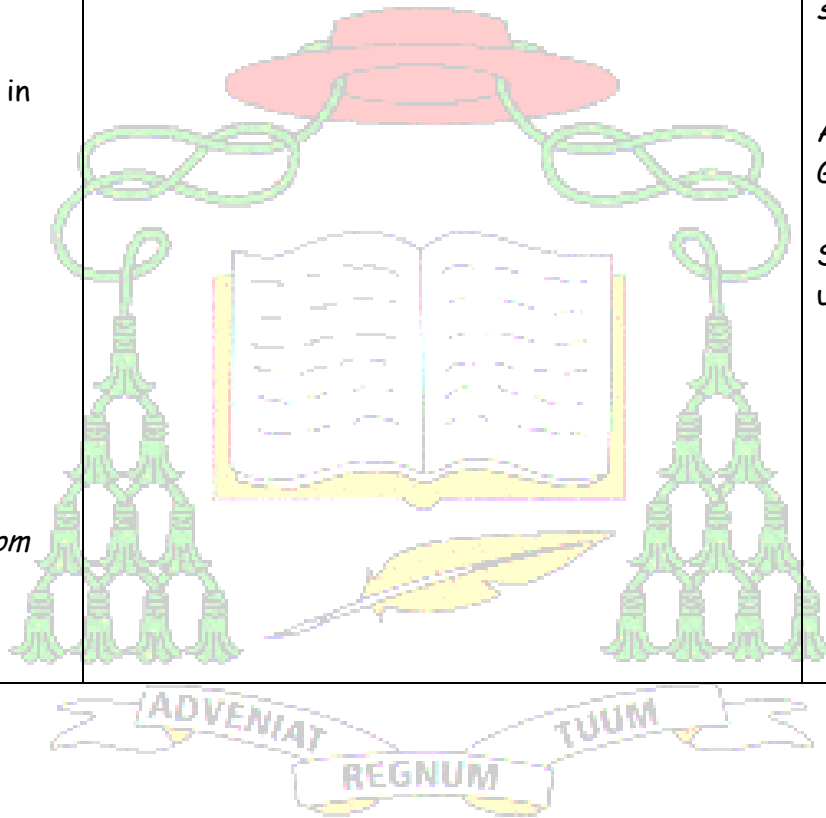
Transport of water in xylem and organic molecules in phloem, investigating transport in plants.

Review & consolidation of:

- Knowledge & understanding
- Use of correct terminology
- Data analysis
- Application of K&U
- Maths skills
- Practical / investigative skills

Consolidation of topics from information from assessments in all areas.

Revision until exams. Following exams start year 13 content.



Section 3.3

Xylem, phloem, translocation, transpiration, stomata, cohesion

AQA Biology AS and Year 1 2nd edition by Glenn Toole and Susan Toole

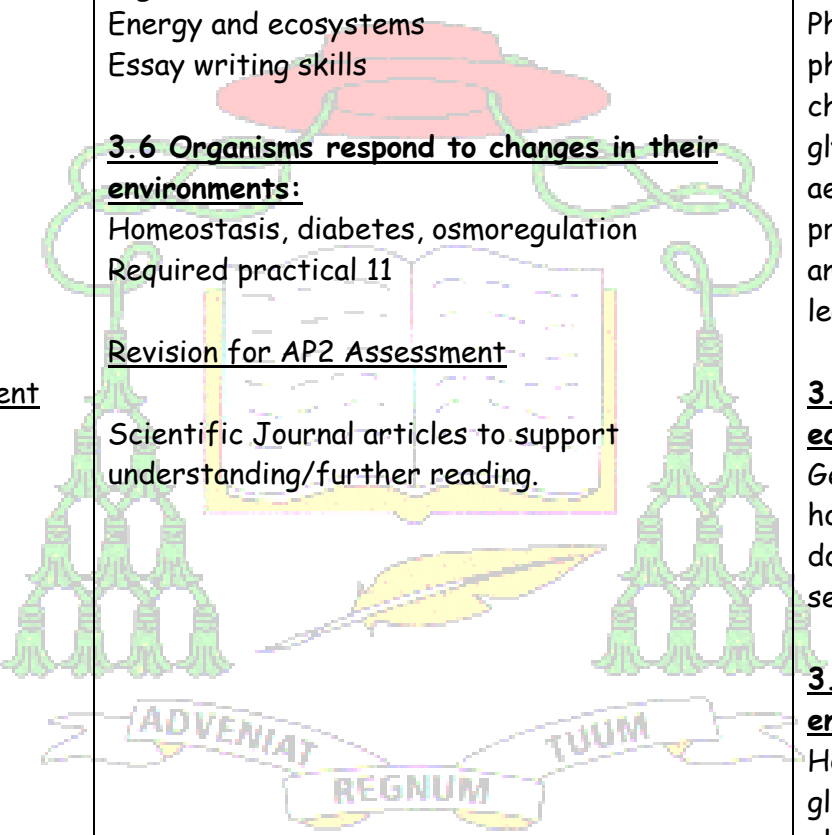
Scientific Journal articles to support understanding/further reading.

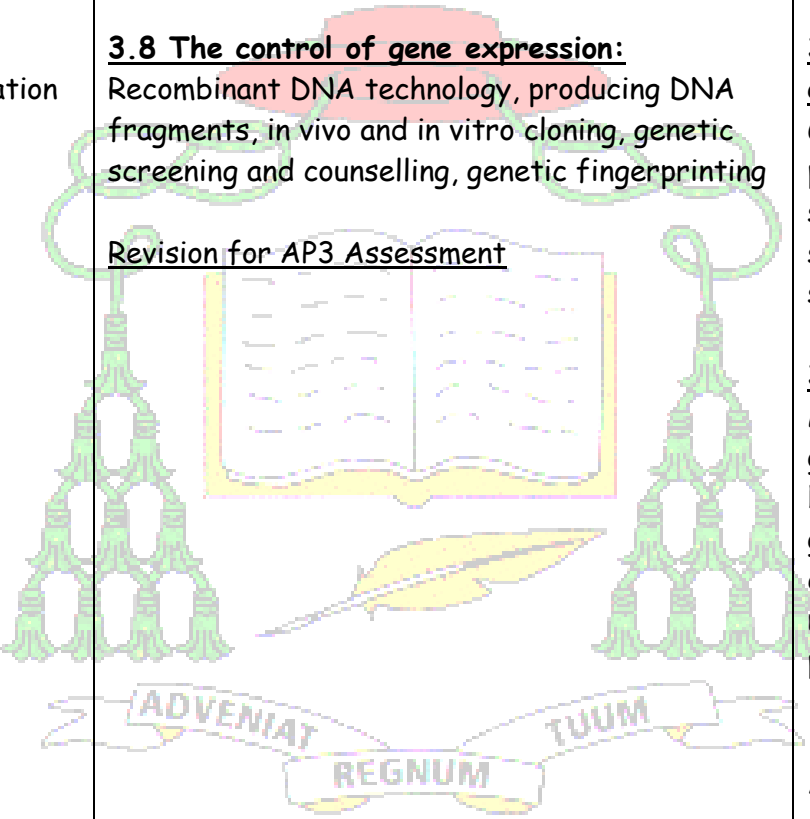
Year 12 Biology

Wider learning experiences to support this A Level	Learning Characteristics instilled in the curriculum	Career Opportunities
University visits Reading opportunities Documentaries recommended Science in the News Use of Seneca to support independent study	<p>Confidence Use of consolidations to revisit prior learning and allow to students to feel open to making mistakes. Encourage discussion. Build practical investigative skills throughout the course.</p> <p>Positive High expectations in presentation of exercise books and homework. Supporting understanding of AO1, AO2, AO3 through modelling and scaffolding responses.</p> <p>Resilience Learners are challenged from the start with high expectations and high challenge. Regular use of exam style questions, the focus of which is on learning from mistakes.</p>	<ul style="list-style-type: none"> • Science careers week • Work experience • University visits • Visiting speakers

Metacognition Methods applied in Teaching

- Consolidation exercise at the beginning of every lesson to revisit prior learning.
- Give sufficient thinking time during discussions.
- Split topics into appropriate chunks depending on student ability to reduce cognitive overload.
- Variation of teaching styles
- Practical skills
- Modelling of exam questions particularly extended response, numeracy and practical techniques
- Valiant vocabulary highlighted
- Independent learning tasks.
- Wider reading recommended and encouraged.
- Find and fix activities used to consolidate
- Regular linking of topics
- Regular retrieval practice

Autumn Half Term 1	Half Term 2	Key Vocabulary/Reading Opportunities
<p><u>3.5 Energy transfers within and between organisms:</u> Photosynthesis, respiration</p> <p>Required practicals 7,8,9</p> <p><u>3.7 Genetics, populations, evolution and ecosystems</u></p> <p>Inherited change</p> <p><u>Revision for AP1 Assessment to include content from AS</u></p>	<p><u>3.5 Energy transfers within and between organisms:</u> Energy and ecosystems Essay writing skills</p> <p><u>3.6 Organisms respond to changes in their environments:</u> Homeostasis, diabetes, osmoregulation Required practical 11</p> <p><u>Revision for AP2 Assessment</u></p> <p>Scientific Journal articles to support understanding/further reading.</p> 	<p><u>3.5 Energy transfers within and between organisms:</u> Photosynthesis, proton, photolysis, photoionisation, electron carrier, chemiosmotic theory, reduction, oxidation, glycolysis, phosphorylation, synthesis, aerobic, anaerobic, biomass, trophic level, net primary production, saprobiont, ammonification, nitrification, fertiliser, leaching, eutrophication</p> <p><u>3.7 Genetics, populations, evolution and ecosystems</u> Genotype, phenotype, gene, allele, homozygous, heterozygous, recessive, dominant, monohybrid, dihybrid, codominance, sex linkage, epistasis</p> <p><u>3.6 Organisms respond to changes in their environments:</u> Homeostasis, optimum, thermoregulation, glucagon, gluconeogenesis, glycogenolysis, glycogenesis, osmoregulation, nephron,</p> <p>AQA Biology A Level and Year 2 2nd edition by Glenn Toole & Susan Toole</p>
Spring Half Term 3	Half Term 4	Key Vocabulary/Reading Opportunities
<p><u>3.6 Organisms respond to changes in their environments:</u></p>	<p><u>3.7 Genetics, populations, evolution and ecosystems</u></p>	<p><u>3.6 Organisms respond to changes in their environments:</u></p>

<p>Response to stimuli, reflex arc, control of heart rate, nervous coordination and muscles Required practical 10</p> <p><u>3.8 The control of gene expression:</u> Gene expression, mutation, stem cells, regulation of transcription and translation, epigenetic control, cancer, genome projects</p>	<p>Populations and evolution, natural selection, speciation, isolation Required practical 12</p> <p><u>3.8 The control of gene expression:</u> Recombinant DNA technology, producing DNA fragments, in vivo and in vitro cloning, genetic screening and counselling, genetic fingerprinting</p> <p><u>Revision for AP3 Assessment</u></p> 	<p>Neurotransmitter, neurone, action potential, depolarisation, repolarisation, refractory period, synapse, summation, myofibril, actin.</p> <p><u>3.7 Genetics, populations, evolution and ecosystems</u> Gene pool, allelic frequency, variation, population, natural selection, stabilising selection, directional selection, disruptive selection, isolation, speciation, allopatric, sympatric</p> <p><u>3.8 The control of gene expression:</u> Mutation, substitution, deletion, inversion, gene, totipotency, transcription, epigenetics, histone, methylation, tumour, sequencing, gene marker, nucleotide, vector, restriction endonuclease, In vivo cloning, in vitro cloning, markers, annealing, primer, plasmid, DNA probes, hybridisation, Genetic fingerprint</p> <p>AQA Biology A Level and Year 2 2nd edition by Glenn Toole and Susan Toole</p> <p>Scientific Journal articles to support understanding/further reading.</p>
<p>Summer Half Term 5</p>	<p>Half Term 6</p>	<p>Key Vocabulary/Reading Opportunities</p>
<p>Consolidation of all topics from both Year 1 and 2 to support exam success.</p>	<p>Consolidation of all topics from both Year 1 and 2 to support exam success.</p>	<p>AQA Biology A Level and Year 2 2nd edition by Glenn Toole and Susan Toole</p>

Information used from assessment to highlight focus of topics External Exams	Information used from assessment to highlight focus of topics External Exams	Scientific Journal articles to support understanding/further reading.
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