



## Archbishop Beck Catholic College

### KS5 Scheme of Work

#### Year 12 Biology



Lesson Sequencing	The High 5 lesson : to be used throughout year	further challenge opportunities
<p>Taught with two teachers each taking different sections which will run simultaneously</p> <p><b>Section 3.1 Biological molecules:</b> Introduction to Biological molecules, carbohydrates, lipids, proteins</p> <p><b>Section 3.2 Cell structure</b> Studying cells - including microscopy Eukaryotic structure &amp; function Prokaryotic structure &amp; function Viruses Mitosis &amp; cell cycle Cell division in prokaryotes Replication of viruses Cancer</p> <p><b>AP1 Assessment</b></p>	<p><b>Consolidation:</b> Departmental starter of 5 questions used in lessons. Focus on revisiting Year 12 content with past exam questions, valiant vocabulary tasks e.g. crosswords and discussions. Also extended questions modelling and practice. Use of exam questions.</p> <p><b>Modelling:</b> Focus on extended questions AO1, AO2, and AO3 criteria. Modelling of skills necessary to answer questions e.g. maths, practical, use of graphs and data. Modelling of how to use unfamiliar equipment.</p> <p><b>Response and Feedback:</b> Q &amp; A, verbal feedback to whole class and individuals, improvement tasks, extension tasks, next step marking. Students to be able to identify own mistakes and self/peer asses accurately.</p> <p><b>Challenge:</b> use of relevant extension tasks, use of exam pro questions. Independent research. Extra reading e.g. from scientific journal articles. Challenge tasks set in response and feedback if appropriate.</p> <p><b>Independence:</b> Use of extra reading and watching documentaries to extend knowledge. Past exam question revision booklets for students to use independently. Seneca online learning platform with revision materials set. Practical work.</p>	<p><b>Extension</b> directed questioning, application and practical style questions, extended questions which focus on all topics, focus on key valiant vocabulary, challenge activities incorporated into response and feedback, peer and self-assessment. Use of Seneca independent revision materials. Careers week and employment opportunities, university visits. Revision booklets created to support independent learning. Extra reading e.g. scientific journals and news articles.</p>

### Section 3.1

#### Biological Molecules

Enzyme action, enzyme inhibition, structure of RNA and DNA, ATP, Water

#### **REQUIRED PRACTICAL 1**

Effect of a factor on rate of enzyme controlled reaction

#### **REQUIRED PRACTICAL 2**

Preparation of cell squash.

### Section 3.2

#### Transport across cell membranes

Structure of cell surface membrane.

#### **REQUIRED PRACTICAL 4**

Factors affecting the permeability of membranes (beetroot)

Diffusion, osmosis, active transport - including absorption of glucose.

#### **REQUIRED PRACTICAL 3**

Osmosis

### AP 2 Assessment

#### Section 3.3

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**Response and Feedback:** Q & A, verbal feedback to whole class and individuals, improvement tasks, extension tasks, next step marking. Students to be able to identify own mistakes and self/peer assess accurately.

**Challenge:** use of relevant extension tasks, use of exam pro questions. Independent research. Extra reading e.g. from scientific journal articles. Challenge tasks set in response and feedback if appropriate.

**Independence:** Use of extra reading and watching documentaries to extend knowledge. Past exam question revision booklets for students to use independently. Seneca online learning platform with revision materials set. Practical work.

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**Organisms Exchange substances with their environment:**

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,

**Section 3.2**

**Cells:**

**Cell recognition & the immune system**

Defence mechanisms: phagocytosis, cell mediated & humoral.

Vaccination

HIV

**Section 3.4 Genetic information, variation and relationships between organisms.**

**DNA, genes & protein synthesis**

Genetic code & chromosome structure

RNA structure

Transcription

Translation

**Section 3.3**

**Organisms Exchange substances with their environment:**

Enzymes and digestion, absorption,  
Section

Mass transport: haemoglobin, circulatory system, heart, cardiac cycle, blood vessels

**Required Practical 5- dissection**

**Section 3.4 Genetic information, variation and**

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**relationships between organisms.**

**Genetic diversity**

Mutations & meiosis as sources of variation  
Adaptation & types of selection

**Required practical 6: Use of aseptic techniques to investigate the effect of antimicrobial substances on microbial growth.**

**Biodiversity**

Taxonomy  
Diversity within communities  
Human activity  
Investigating diversity & variation

**AP3 Assessment**

**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.

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## Year 13 Biology

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<p>Taught with two teachers each taking different sections which will run simultaneously</p> <p><b><u>3.5 Energy transfers within and between organisms:</u></b></p> <p>Photosynthesis Respiration</p> <p><i><b>Required practical 7:</b> Use of chromatography to investigate the pigments isolated from leaves of different plants, eg, leaves from shade-tolerant and shade-intolerant plants or leaves of different colours.</i></p> <p><i><b>Required practical 8:</b> Investigation into the effect of a named factor on the rate of dehydrogenase activity in extracts of chloroplasts</i></p> <p><i><b>Required practical 9:</b> Investigation into the effect of a named variable on the rate of respiration of cultures of single-celled organisms.</i></p> <p><b><u>3.7 Genetics, populations, evolution and ecosystems</u></b></p> <p>Inherited change</p> <p><b><u>3.5 Energy transfers within and between organisms:</u></b></p> <p>Energy and ecosystems Essay writing skills</p> <p><b><u>3.6 Organisms respond to changes in their environments:</u></b></p> <p>Homeostasis, diabetes, osmoregulation</p> <p><b><u>Required practical 11:</u></b> Production of a dilution series</p>	<p><b>Consolidation:</b> Departmental starter of 5 questions used in lessons. Focus on revisiting Year 12 content with past exam questions, valiant vocabulary tasks e.g. crosswords and discussions. Also extended questions modelling and practice. Use of exam questions.</p> <p><b>Modelling:</b> Focus on extended questions AO1, AO2, and AO3 criteria. Modelling of how to plan essays for paper 3. Use of modelled responses from previous students to essays and exam questions.</p> <p><b>Response and Feedback:</b> Q &amp; A, oral feedback to whole class and individuals, improvement tasks, extension tasks, next step marking. Students to be able to identify own mistakes and self/peer asses accurately.</p> <p><b>Challenge:</b> use of relevant extension tasks, use of exam pro questions. Independent research. Extra reading e.g. from scientific journal articles. Challenge tasks set in response and feedback if appropriate. Challenge tasks provided in lessons by use of extension or high demand questions.</p> <p><b>Independence:</b> Use of extra reading and watching documentaries to extend knowledge. Past exam question revision booklets. Seneca online learning platform Essay writing.</p> <p><b>Consolidation:</b> Departmental starter of 5 questions</p>	<p><b>Extension</b> directed questioning, extended questions focus on all topics, focus on key valiant vocabulary, challenge activities incorporated into response and feedback, peer and self-assessment.</p> <p>Use of Seneca independent revision materials.</p> <p>Careers week and employment opportunities, university visits. Revision booklets created to support independent learning. Essay writing.</p> <p><b>Extension</b> directed questioning, extended</p>

of a glucose solution and use of colorimetric techniques to produce a calibration curve with which to identify the concentration of glucose in an unknown 'urine' sample.

### **3.6 Organisms respond to changes in their environments:**

Response to stimuli, reflex arc, control of heart rate, nervous coordination and muscles

***Required practical 10:*** Investigation into the effect of an environmental variable on the movement of an animal using either a choice chamber or a maze.

### **3.8 The control of gene expression:**

Gene expression, mutation, stem cells, regulation of transcription and translation, epigenetic control, cancer, genome projects

### **3.7 Genetics, populations, evolution and ecosystems**

Populations and evolution, natural selection, speciation, isolation

***Required practical 12:*** Investigation into the effect of a named environmental factor on the distribution of a given species.

### **3.8 The control of gene expression:**

Recombinant DNA technology, producing DNA fragments, in vivo and in vitro cloning, genetic screening and counselling, genetic fingerprinting

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