

Biology A Level Year 12

Throughout the course students will develop important skills including critical thinking, data analysis, problem-solving, and practical investigation. They will build confidence in applying Biology to real-world issues such as health, the environment, and new evolving technologies, as well as gaining skills that support further study and a wide range of careers.

A good A Level Biology student is keen to understand living things at a molecular and cellular level through to whole organisms and ecosystems. They pay attention to detail and are committed to accurately using scientific vocabulary to explain theories, concepts and ideas clearly.

They are confident at using their knowledge to answer new and unfamiliar questions and enjoy problem solving. They think critically about evidence, recognising patterns, evaluating experimental methods, and drawing reasoned conclusions based on data. They are comfortable working with quantitative information, including graphs, ratios, and statistical tests, and can use mathematics to support biological conclusions.

A good Biology student takes an active role in practical work, following instructions carefully while thinking about why each step matters. They can analyse results, draw conclusions from evidence, and consider how reliable their findings are.

They are organised and motivated and are keen to make links between different topics and across subjects. They are willing to practise extended written answers and develop clear, logical explanations. Most importantly, they are prepared to ask questions, think independently, and engage fully with the subject.

Summary of course content

The examining board for A level Biology is AQA.

In year 12 there are 4 large units:

Unit 1: Biological molecules

Unit 2: Cells

Unit 3: Organisms exchange substances with their environment

Unit 4: Genetic information, variation and relationships between organisms

You can find the AQA specification here:

<https://www.aqa.org.uk/subjects/biology/a-level/biology-7402/specification/specification-at-a-glance>

Below is an overview of tasks / activities you should be completing outside of lessons:

Weekly:	• Completion of tasks and activities that are set as homelearning by both of your teachers (homelearning is set weekly)
Fortnightly:	In addition to the tasks and activities outlined above you should be using your time outside of lessons to: • Review recent lessons • Learning (off by heart) key terminology – remember to use the powerpoints (key words and definitions are in purple), your own notes and exam markschemes • Revising the content covered so far – this should be evidenced by producing and showing the revision resources you have used and created such as revision cards, mind maps, completed and marked practice exam questions • Completion of additional reading when set – this will be posted on teams and how you can produce evidence of this will be explained for each of these reading tasks
Half termly:	• Revision: this should be evidenced by producing and showing the revision resources you have used and created such as revision cards, mind maps, completed and marked practice exam questions

In addition to the resources provided by your teacher, other useful resources include:

On TEAMS are resources including:

- Lesson / topic list
- Textbook (one is on teams)
- Lesson powerpoints and resources
- Videos (stated on powerpoints)
- Required practical powerpoints, booklets and exam questions
- Homelearning tasks
- Past paper questions for each topic
- End of topic tests and markschemes
- Essay question – powerpoint and instructions on how to structure your essay, past essay questions and essay questions templates

Useful websites:

Miss Estruch: <https://www.youtube.com/@MissEstruchBiology>

Free science lessons: <https://www.freesciencelessons.co.uk/a-level-revision-videos/a-level-biology/>

PMT (physics and maths tutor): <https://www.physicsandmathstutor.com/biology-revision/a-level-aqa/>

Amoeba sisters: <https://www.youtube.com/user/AmoebaSisters>

Independent Learning Schedule – two hours directed by each of your teachers (subject to change) – this is in addition to your homelearning tasks :

Week beginning	Teacher 1 (minimum 1 hour per week) Unit 3.1 Biological Molecules Unit 3.3 Exchange	Teacher 2 (minimum 1 hour per week) Unit 3.2 Cells Unit 3.4 Genetic information, variation & relationships between organisms
7 th September Enrolment week	Transition Task	Transition Task
14	Learn / revise: Monomers + Polymers : Key facts and definitions - provide evidence of this Continued revision of GCSE topics for transition assessment (list issued by teacher)	Learn / revise: - Location of organelles (plant and animal) - Role of each organelle (plant and animal) Provide evidence of this + Continued revision of GCSE topics for transition assessment (list issued by teacher)
21	Learn / revise: - Identify from diagrams the 3 main monosaccharides, disaccharides, polysaccharides - Disaccharide facts Continued revision of GCSE topics for transition assessment (list issued by teacher)	Pre-read / revise: - Similarities and differences between eukaryotic and prokaryotic cells - Viral replication - Plus associated video Provide evidence of this Continued revision of GCSE topics for transition assessment (list issued by teacher)
28	Revise: - Function of each polysaccharide and how it relates to structure - Similarities and differences between the polysaccharides Continued revision of GCSE topics for transition assessment (list issued by teacher)	Pre-read / revise:: - Differences between types of microscope - Purpose of each stage of cell fractionation and ultracentrifugation - Plus associated video Provide evidence of this
5 th October	Pre-read - Triglycerides - structure - Phospholipids – structure - Test for lipids - Watch video (see powerpoint)	Review B2 topic from GCSE (cell cycle and mitosis) ahead of mitosis lesson
12	Revise Similarities and differences between phospholipids and triglycerides	Create key words, definitions and processes summary list / revision cards using exam wording (use powerpoints and markschemes)
19	Review GCSE topic: - Protein structure - Enzymes – how they work - Factors that affect an enzyme-controlled reaction	Preparation for mitosis RPA: - Watch associated videos - Pre-read method - Answer questions on the method
26	Half term	
2 nd November	Create key words, definitions and processes summary list / revision cards using exam	Mitosis RPA exam booklet– do and self-mark using markschemes

	wording (use powerpoints and markschemes) for: - Carbohydrates - Lipids - Protein structure	
9	Preparation for enzyme RPA: - Watch associated videos - Pre-read method Answer questions on the method	Revision for assessment – provide evidence
16	Enzyme RPA booklet – do and self-mark using markschemes Revision for carbohydrates, proteins & lipids assessment – provide evidence	Pre-read / revise: • Label diagram of a membrane • State substances that can freely diffuse and why • State substances that cannot freely diffuse and why • Function of each component of a membrane • Plus associated video Provide evidence of this
23	Post assessment task	Preparation for membrane permeability RPA: - Watch associated videos - Pre-read method Answer questions on the method
30	GCSE recap of : - DNA structure -Protein synthesis Pre-read / revise: • Structure of nucleotides (RNA and DNA) • Similarities and difference between RNA and DNA nucleotides • DNA structure	Preparation for water potential RPA: - Watch associated videos - Pre-read method Answer questions on the method
7th December	DNA replication – read the experiments conducted to identify if replication is conservative or semi-conservative – explain the results -	RPA membrane permeability exam booklet – do and self-mark using markschemes
14	Research: Identify from your own research processes that: - Require the hydrolysis of ATP Result in the condensation of ATP (formation of ATP)	Revision for assessment on transport across membranes – provide evidence
21	Christmas holidays	
28	Christmas holidays	
4 th January	Water experiments – Explain the results achieved for each experiment using knowledge of the properties of water	Review GCSE topic: - White blood cells - Vaccination - Types of pathogen (bacteria, fungus, protist and viruses) Ahead of starting the immune system topic

11	Revision for assessment on Biological molecules – provide evidence	Antigens are a protein – explain in terms of protein structure how antigens can vary between pathogens Research – 1. Find and list examples of ‘antigen presenting cells’ 2. Find examples of other ‘things’ with antigens Textbook summary questions p102 to 103
18	Post assessment task	Summarise the video on white blood cells and antibodies (in powerpoint) Summarise / flow diagram of the response to a pathogen to include phagocytes, T helper cells and B lymphocytes (plasma and memory)
25	Create key words, definitions and processes summary - using exam wording (use powerpoints and markschemes) for: - Gas exchange in plants (dicotyledonous and xerophytic) (+relate structure to function) - Gas exchange in insect tracheal systems (+relate structure to function)	Summarise the scientific paper on HIV + Textbook practice questions p122 to 127
1 st February	Work experience	
8	Dissection preparation: - Watch the fish gill dissection video Make notes on: - Key things to identify when dissecting - Conduct a risk assessment – what are the hazards, the risk and control measures (see risk assessment table)	Pre-read: - Monoclonal antibodies powerpoint Watch: - Video on monoclonal antibodies + Revision for assessment
15	Half term	
22	Read textbook pages 142 – 150 Answer summary questions on page 145 Answer pulmonary ventilation question p145 Answer questions on correlations and causal relationship on p148 Answer questions Risk factors + Smoking and lung cancer p149 and 150	Revision for assessment – provide evidence
1 st March	Review of year 12 biological molecules - carbohydrates, proteins and lipids – required before start digestion and absorption – evidence examples: notes, revision diagram, revision / review cards	Post assessment task
8	Read textbook pages 151 to 157 Answer questions on Lactose intolerance p154 Answer questions on Absorption of fatty acids p157 Answer practice questions p158 to 160	Review GCSE topic: - DNA structure - Protein synthesis - Meiosis
15	Revision for assessment on: Gas Exchange + Digestion and Absorption Evidence of revision activities required	Consolidation task: - Protein synthesis To include going over own notes (evidence required), watching the videos (see powerpoint) and use of the textbook

		Textbook pages 211 to 216 - Answer summary questions, green box questions + purple box questions
22	Revision for assessment on: Gas Exchange + Digestion and Absorption Evidence of revision activities required	Consolidation task: - Mutation - Meiosis To include going over own notes (evidence required), watching the videos (see powerpoint) and use of the textbook Textbook pages 224 to 228 - Answer summary questions, green box questions + purple box questions
29	Easter holiday	
5 th April	Easter holidays	
12	Post assessment task	Revision for assessment – provide evidence
19	Textbook pages 168 to 173 – Answer summary questions, green box questions + purple box questions	Post assessment task
26	Textbook pages 174 to 182 - Answer summary questions, green box questions + purple box questions	Pre-read / watch: - Classification - Evolutionary relationships Powerpoint, textbook / revision guide + watch video – evidence required
3 rd May	RPA preparation: - Read method - Watch video - Answer practical questions	Research, find your own: - Example of directional selection and explain WHY it is directional - Example of stabilising selection and explain WHY it is stabilising
10	Textbook pages 161 to 167 - Answer summary questions, green box questions + purple box questions	Watch video on species and courtship
17	Textbook: Practice questions p194 to 195	Summarise research article on methods used to identify variation
24	Mass transport revision: Evidence of revision activities required	Preparation for antibiotic resistance in bacteria RPA: - Watch associated videos - Pre-read method Answer questions on the method
31	Half term	
7 th June	Post assessment task	Revision for mock exams – provide evidence
14	Revision for mock exams – provide evidence	Revision for mock exams – provide evidence
21	Trial examinations	Trial examinations
28	Post mock task 1	Post mock task 1
5 th July	Post mock task 2	Post mock task 2
12	Review GCSE topic: - Photosynthesis - Factors affecting rate of photosynthesis Review A level topic: - Structure of leaf and adaptations for gas exchange	Review GCSE topic: - Inheritance - Genetic crosses
19	Review of A level topic:	

	- Xylem + link role of xylem in relation to photosynthesis - Phloem + link role of phloem in relation to photosynthesis	
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