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**A-Level Biology A level Guide**

**How Biology will be taught:**

A-level Biology meshes practical skills, observations, theories and knowledge about living things. Key concepts are taught face to face though a mixture of video clips, presentations and practical work. There will be a lot of questioning to ensure comprehension, discussion and practical work. All students have access to an online textbook, support sheets, checklists and support with exam questions. The course is assessed by 3 exams, which make up 100% of the assessed course; therefore the method of assessment will be a mock exam at the end of each topic.

**Working expectations:**

You are expected to put as many hours into A level Biology outside of lessons as you would in lessons, thus approximately 4.5 hours including homework. A level Biology is primarily about applying your biological knowledge to novel situations, thus you need to be reading and writing in the subject frequently in your own time. Firstly, in your free periods you should be going back over each lesson using the guide given to you at the start of the year and then using the textbook on Kerboodle to make more detailed notes. You should of course be completing any homework questions.

**What 100% effort in this subject looks like:**

* Putting in the same amount of time in and out of lesson.
* Always re-writing your lesson notes using the online textbook.
* Using the Kerboodle checklists to ensure thorough notes.
* Any areas that you are not sure on, you go onto Kerboodle and use the support sheets; after this you seek support from your teacher.
* Use websites with past paper questions, such as Maths and Physics tutor to supplement your notes and practise exam questions.
* Wider reading in the subject, such as reading the Biological review journal.

**Folder Policy:**

*Your folder should have:*

* Been organised into chapters and units shown in the KS5 guide.
* Glossary printed off.
* All marked work should be at the front of each chapter they relate to as when revising it is better to focus on the areas which you are not as sure of.
* All end of topic tests and unit tests which are marked will be kept in a school folder by your teachers and will be returned to you at the end of the year before the exam period.

**Laboratory Book Policy:**

At the end of Year 2 you will either pass or fail your Common Practical Assessment Criteria (CPAC) which is based on the practical work you complete in Biology.

*Your lab book should have as a minimum:*

* Every page numbered
* PROUD science expectations (inside cover)
* Lab book expectations (page 1)
* Health and safety agreement – safety rules (page 2)
* Contents page (pages 3-4)

*From access to the school shared drive in the back of the lab book you should have:*

* References
* Tables and Graphs
* AQA Glossary of terms
* Biology apparatus techniques and required practical (Biology AT and RP)
* NUAST common practical assessment criteria (CPAC) evidence

It is the your responsibility to ensure your lab book is completed to specification; however teachers will support these by sharing which CPAC criteria will be examined and feeding back to you. This will be built upon throughout the 2 years.

**What Marking looks like:**

* Ordinary class notes are not marked; they are for you only.
* Some homeworks that are gathering of information will be checked visually but not graded or specifically marked.
* Homeworks that involve your thinking and analysis will be marked with scores/grades.
* Lab books will be assessed on the CPAC criteria as either red (missed a section) /amber (working towards) or green (met the criteria).
* End of topic tests and unit tests will be marked and a directed improvement reflective task (DIRT) associated to help improve knowledge/understanding.

**What Homework looks like:**

* Exam questions
* Group poster presentation
* Research tasks
* Extended writing tasks
* Prevision reading
* Modelling
* Group or pair assignment

**Specification at a glance:**

8 units over 2 years:

1. Biological molecules

All life on Earth shares a common chemistry. This provides indirect evidence for evolution. Despite their great variety, the cells of all living organisms contain only a few groups of carbon-based compounds that interact in similar ways.

Carbohydrates are commonly used by cells as respiratory substrates. They also form structural components in plasma membranes and cell walls. Lipids have many uses, including the bilayer of plasma membranes, certain hormones and as respiratory substrates. Proteins form many cell structures. They are also important as enzymes, chemical messengers and components of the blood. Nucleic acids carry the genetic code for the production of proteins. The genetic code is common to viruses and to all living organisms, providing evidence for evolution. The most common component of cells is water; hence our search for life elsewhere in the universe involves a search for liquid water.

1. Cells

All life on Earth exists as cells. These have basic features in common. Differences between cells are due to the addition of extra features. This provides indirect evidence for evolution.

All cells arise from other cells, by binary fission in prokaryotic cells and by mitosis and meiosis in eukaryotic cells.

All cells have a cell-surface membrane and, in addition, eukaryotic cells have internal membranes. The basic structure of these plasma membranes is the same and enables control of the passage of substances across exchange surfaces by passive or active transport.

Cell-surface membranes contain embedded proteins. Some of these are involved in cell signalling – communication between cells. Others act as antigens, allowing recognition of ‘self’ and ‘foreign’ cells by the immune system. Interactions between different types of cell are involved in disease, recovery from disease and prevention of symptoms occurring at a later date if exposed to the same antigen, or antigen-bearing pathogen.

1. Organisms exchange substances with their environment

The internal environment of a cell or organism is different from its external environment. The exchange of substances between the internal and external environments takes place at exchange surfaces. To truly enter or leave an organism, most substances must cross cell plasma membranes.

In large multicellular organisms, the immediate environment of cells is some form of tissue fluid. Most cells are too far away from exchange surfaces, and from each other, for simple diffusion alone to maintain the composition of tissue fluid within a suitable metabolic range. In large organisms, exchange surfaces are associated with mass transport systems that carry substances between the exchange surfaces and the rest of the body and between parts of the body. Mass transport maintains the final diffusion gradients that bring substances to and from the cell membranes of individual cells. It also helps to maintain the relatively stable environment that is tissue fluid.

1. Genetic information, variation and relationships between organisms

Biological diversity – biodiversity – is reflected in the vast number of species of organisms, in the variation of individual characteristics within a single species and in the variation of cell types within a single multicellular organism.

Differences between species reflect genetic differences. Differences between individuals within a species could be the result of genetic factors, of environmental factors, or a combination of both.

A gene is a section of DNA located at a particular site on a DNA molecule, called its locus. The base sequence of each gene carries the coded genetic information that determines the sequence of amino acids during protein synthesis. The genetic code used is the same in all organisms, providing indirect evidence for evolution.

Genetic diversity within a species can be caused by gene mutation, chromosome mutation or random factors associated with meiosis and fertilisation. This genetic diversity is acted upon by natural selection, resulting in species becoming better adapted to their environment.

Variation within a species can be measured using differences in the base sequence of DNA or in the amino acid sequence of proteins.

Biodiversity within a community can be measured using species richness and an index of diversity.

5. Energy transfers in and between organisms (A-level only)

6. Organisms respond to changes in their internal and external environments (A-level only)

7. Genetics, populations, evolution and ecosystems (A-level only)

8. The control of gene expression (A-level only)

**Summer preparation**

The purpose of giving you a summer bridging task is:

1. To provide a bridge from level 2 to level 3 study, and lead into the early stages of the course.
2. To engage you in independent learning which is required at level 3.
3. To encourage you to develop your work ethic and commitment to study. iv. To measure your suitability for the course and assess your initial levels of achievement.

**Task 1**:

The first unit will be biological molecules; in order to prepare you for this unit complete the table below from your GCSE knowledge (if you are stuck revisit the knowledge on BBC bite size) <https://www.bbc.co.uk/bitesize/guides/zcttv9q/revision/1>).

|  |  |  |  |
| --- | --- | --- | --- |
| **Large molecule** | **Digestive enzyme** | **Location** | **Small molecule** |
| Carbohydrate |  |  |  |
|  | Amylase |  |  |
|  |  |  | Amino acids |
|  |  |  | Amino acids |
| Lipids |  |  |  |

Then write a paragraph on enzymes; include what are they made from, how they work and what factors affect them.

**Task 2:**

Complete the AQA Transition Guide, there are 7 tasks which will help remind you of key ideas mainly from unit 2 (cells) and practise key skills such as unit conversion, graph drawing and interpretation. This is attached to our flying start packs

**Extension/ Oxford or Cambridge**

Enrol yourself on this MOOC, Future Learn course, and complete it to get ahead of the competition.

<https://www.futurelearn.com/courses/the-biology-of-bugs-brains-and-beasts>

**Please bring your work with you to your first lesson.**

**Potentially useful websites:**

<https://www.senecalearning.com/>

<https://www.physicsandmathstutor.com/biology-revision/a-level-aqa/>

**Link to the AQA Biology Specification:**

<https://filestore.aqa.org.uk/resources/biology/specifications/AQA-7401-7402-SP-2015.PDF>