

## B.V.G.S A LEVEL BIOLOGY CURRICULUM OVERVIEW

### What is Biology?

Biology is the science that studies life and living organisms, including their physical structure, chemical processes, molecular interactions, physiological mechanisms, development and evolution. Despite the range of different areas of Biology, there are certain unifying concepts that consolidate it into a single, coherent field. Students should recognise the cell as the basic unit of life, nucleotides as the basic unit of heredity, the structure and properties of biological molecules and evolution as the engine that propels the creation and extinction of species. Living organisms are able to survive by exhibiting specific characteristics and being adapted to their environment. Students should appreciate these ideas and apply them in order to question whether humans could and indeed, should manipulate them to our advantage whilst also evaluating their impact and use.

### Big ideas

Students should build on the Big Ideas they completed at GCSE level, they are and include concepts such as

### Organisms

- All life on Earth exists as cells.
- 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..
- Diseases, how they may be prevented, cured, spread and treated.
- How organisms can be recyclers of nutrients, sources of medicine and food and how they can be conserved in a constantly evolving world.
- Organisms increase their chance of survival by responding to changes in their environment.

## Ecosystems

- Life depends on continuous transfers of energy.
- In photosynthesis, light is absorbed by chlorophyll and this is linked to the production of ATP.
- In respiration, various substances are used as respiratory substrates. The hydrolysis of these respiratory substrates is linked to the production of ATP.
- 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
- Nutrients are recycled within natural ecosystems, exemplified by the nitrogen cycle and the phosphorus cycle.

## Genes

- DNA is the molecule of life and codes for proteins.
- The variety of life, both past and present, is extensive, but the Biochemical basis of life is similar for all living things.
- All cells arise from other cells, by binary fission in prokaryotic cells and by mitosis and meiosis in eukaryotic cells.
- 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.
- Gene mutations involve a change in the base sequence of chromosomes.
- All life on earth has a common chemistry. This provides indirect evidence for evolution.
- The theory of evolution underpins modern Biology.

## How will I learn?

You will complete 10 1 hour lessons a fortnight split between two teachers.

These lessons will develop your factual knowledge and understanding, your mathematical skills, your data analysis skills including plotting and interpreting appropriate graphs as well as your ability to evaluate data from investigations commenting on experimental design and validity. Your practical skills including identifying hazards, minimising risk, recording results accurately and presenting data appropriately.

Students will also be given the opportunity to develop their knowledge and skillset in extracurricular opportunities such as the Royal Society of Biology's intermediate Biology Olympiad and the opportunity to attend local engineering society's guest speaker seminars throughout the year.

## How will I be assessed?

You will be assessed throughout your Biology course via regular topic assessments and end of year Ucas examinations. Students are expected to develop their practical, mathematical and data analysis skills whilst completing 12 required practical investigations, delivered alongside the relevant area of content. Practical skills will be assessed by observing and questioning your method and choice of equipment for various tasks during investigations as well as written follow up tasks including presenting data, statistical tests and exam questions

Three written examinations of 2 hours will be completed consisting of 91, 91 and 78 marks each, each worth 35%, 35% and 30% respectively.

Questions will include a mixture of short and long answer questions, extended response questions, comprehension questions structured questions including practical techniques, critical analysis of experimental data and an essay from a choice of two titles.