

Subject:

# Biology

Biology Intent:

The biology department aims to equip our students with an understanding of the natural world and their place within it in the hope they can be instrumental in preserving biodiversity for future generations. Our students will be able to make well informed decisions about health and will develop skills in investigative techniques, research and analytics.

Our Exam Board is: AQA

## The Big Questions...

### Year 12

**Biological Molecules:** What are the structures and properties of the fundamental building blocks of living organisms? How do enzymes work and what factors can affect their action? What is the structure of DNA and RNA? How can DNA be replicated? Why is ATP known as the universal energy currency? Why is water so important in living organisms?

**Cells:** How do we study cells? What is the difference between eukaryotic and prokaryotic cells? How do cells divide to reproduce? What happens in the stages of mitosis and the cell cycle? How is the structure of the cell surface membrane specialised for its function? How do named substances move in and out of cells? How does our immune system work? What do vaccines do to prevent disease?

**Exchange and transport:** How does gas exchange differ between single cells organisms, insects, fish and mammals? How do we digest food and absorb the products of digestion? How does the mammalian circulatory system work to provide oxygen to cells? How do plants transport water and other molecules?

**Genes, Variation and Relationships:** How does DNA code for proteins? What are the stages in protein synthesis? How do mutations occur and what are the effects? What is genetic diversity and how does selection occur? How are species classified? How can we investigate diversity and what impact are humans having on it?

### Year 13

**Energy transfer:** How does photosynthesis work? What are the stages in aerobic respiration? How does energy and nutrients flow through an ecosystem? What are the environmental implications of using fertilisers in agriculture?

**Response to Change:** How do plants and animals respond to external stimuli? How does the nervous system work? How do muscles contract and relax? How are our internal conditions kept constant? What role do hormones play? How does osmoregulation work?

**Genetics, Populations, Evolution and Ecosystems:** How are characteristics inherited? What are the different effects of selection on evolution? How do new species arise? How are ecosystems organised? What factors affect population growth? What drives natural selection? What is succession? How can we conserve habitats and species to maintain biodiversity?

**Control of Gene Expression:** How are different genes expressed? What are Stem cells? How can gene expression be linked to cancer? What is epigenetics? How does recombinant DNA technology work and how can it be used in genetic screening and genetic fingerprinting?

**Statistics:** What is a null hypothesis? How can we tell if experimental data is significant or not? How can we prove our level of confidence in our conclusions?

### What skills will I develop?

- CPAC practical skills as designated by AQA e.g. designing and following methods, completing risk assessments, presenting and processing data appropriately.
- Skills in maths and statistics.
- Problem solving skills.
- Skills in presenting to an audience.
- Essay writing.

### How will I be assessed?

At Key stage 5, work is assessed at each topic through A-Level graded exams so students can understand their strengths and weaknesses on each unit. Teacher feedback is given both verbally and on assessed work so that pupils can improve their work before moving on to the next section of the course

#### Examinations:

Yr12 will complete two mock exams: one after Christmas and one at the end of Year 12.

Yr13 will complete three external exams on the complete A Level Course in the spring term.

All A Level Biology students must complete a series of required practicals demonstrating CPAC skills as designated by AQA. This will be monitored internally and externally.

### What great resources can I use?

- Lots of great resources to use in independent study and revision can be found here: <https://yateleyschool.sharepoint.com/:f/s/Science-ReadOnly/EllimCtboyBDqJNmuyZ1OjIB8yQXBy59SRNpXIEou1qdzq?e=FaVObP>
- CGP AQA A Level Biology Revision guide.
- CGP Essential Maths Skills for A Level Biology.
- AQA A level Biology (2<sup>nd</sup> edition) Published by Oxford. Class Textbook.

### Three ways that parents/carers can help...

1. Keep an eye on SMHW, encourage students to spend time at home consolidating their knowledge either with notes or quizzes.
2. By testing your son/daughter with their revision guides and revision mind maps.
3. By contacting the Biology department whenever you need additional support or have questions about the course [sarah.mccarthy@yateley.hants.sch.uk](mailto:sarah.mccarthy@yateley.hants.sch.uk)