

Year 12

Biological Molecules

We explore the fundamental building blocks of organisms- the molecules of which their cells are composed. We explore carbohydrates, lipids, proteins, nucleic acids and water

Cells

Cells share basic features and yet show remarkable diversity in both structure and function. We explore cell structure, transport and cell recognition and the immune system.

Organisms exchange substances with their environment

All cells exchange material between themselves and their environment. We explore exchange in animals as well as mass transport in both animal and plant system.

Genetic information, variation and relationships

We explore DNA, genes and protein synthesis, genetic diversity and adaptation and biodiversity



Knowledge	Attributes / Character	Skills	Experiences
<p>Biological molecules</p> <p>Cells</p> <p>Transport across membranes</p> <p>Enzymes, digestion & absorption</p> <p>DNA, genes and protein synthesis</p> <p>Cell recognition & the immune system</p> <p>Genetic diversity</p> <p>Organisms exchange substances with their environment</p> <p>Biodiversity</p>	<ul style="list-style-type: none"> Confidence- Students build on their understanding of good experimental design from GCSE and we introduce the idea of a null hypothesis to reduce bias. Organisation- Students develop the ability to use a range of more sophisticated and precise apparatus with a focus on strong technique, for example students should know how to use a graduated pipette correctly, a colorimeter and microscope. Students are taught how to present data in tables and graphs correctly following biological conventions. Students learn how to control variables and take account of those which are not easily controlled. Resilience- students learn how to interpret data presented in a wide variety of formats and are encouraged to evaluate the claims of scientists based on a critical analysis of experimental design. Students become increasingly adept at handling numerical data and using standard deviation, statistical tests and calculations of uncertainties to help support their evaluations as they move through Year 12. Empathy- learning about the work of DNA technology and how it has helped to change the view of new technologies and genetic inheritance analysis in science e.g phylogenetic trees. 	<ul style="list-style-type: none"> Students build on their understanding of good experimental design from GCSE and we introduce the idea of a null hypothesis to reduce bias. Students develop the ability to use a range of more sophisticated and precise apparatus with a focus on strong technique, for example students should know how to use a graduated pipette correctly, a colorimeter and microscope. Students are taught how to present data in tables and graphs correctly following biological conventions. Students learn how to control variables and take account of those which are not easily controlled. Students learn how to interpret data presented in a wide variety of formats and are encouraged to evaluate the claims of scientists based on a critical analysis of experimental design. Students become increasingly adept at handling numerical data and using standard deviation, statistical tests and calculations of uncertainties to help support their evaluations as they move through Year 12. 	<p>Biology in Action- Warwick</p> <p>Field work through the Field Studies Council</p> <p>Required practical 1 - investigating the effect of a variable on an enzyme controlled reaction</p> <p>Required practical 2 - observing mitosis under the microscope</p> <p>Required Practical 3 - determining water potential of plant tissue (potato)</p> <p>Required Practical 4 - effect of variable of membrane permeability (beetroot)</p> <p>Required practical 6 - Testing the effects of antibiotics Aseptic techniques</p> <p>Required practical 5 - Dissection</p>