

Yr 12 OCR A Biology Curriculum overview

Curriculum intent: Science encompasses everything that we are and allows us to make sense of the world around us. Science at The Hart School is more than just a subject. We believe an outstanding science education should develop students' curiosity and scientific knowledge to question the world in which we live, enable critical thinking and encourage students to become socially aware global citizens.



Our Science faculty has planned an inspiring, inclusive, and diverse curriculum that is designed to engage and enthuse students with the real-life applications of the subject whilst promoting ambition and aspirations for their future.

In an ever-changing world, in which STEAM subjects are at the forefront of advancements for the future, we want to prepare our students for this by not only looking at the knowledge of the subject, but also the methods, processing skills and applications associated with it. This ensures that our students are scientifically literate, able to evaluate what they see in the news and the world around them and make informed decisions that will affect their future lives and the planet.

	Autumn 1		Autumn 2	Spring 1		Spring 2		Summer 1		Summer 2		
Core Course Topic: These topics are taught in small bitesize chunks and revisited regularly.	Module 2: Chapter 2. Basic components of living systems	Module 2: Chapter 3. Biological molecules		Module 2: Chapter 4. Enzymes	Module 2: Chapter 5. Plasma membranes	Module 2: Chapter 6. Cell division	Module 3: Chapter 7. Exchange surfaces and breathing	Module 3: Chapter 9. Transport in plants	Module 3: Chapter 8. Transport in animals	Module 4: Chapter 10. Classification and evolution	Module 4: Chapter 11. Biodiversity	Module 4: Chapter 12. Communicable disease
Additional support links: Here are links to additional resources which will help your child	Module 2: revision resources			Module 2: revision resources		Module 3: revision resources		Module 4: revision resources				
Knowledge: Included here is the specific knowledge your child will learn in detail	Basic components of living systems provides an introduction to cells and microscopy techniques. An understanding of cell biology is essential for most onward routes for biologists.	Biological molecules will begin to explore the biochemistry needed for A level, whilst providing a firm grounding for the study of key biological disciplines, such as medicine and disease research.	Assessment 1	Enzymes are vital for many biological processes. In this chapter you will learn how they are structured and how they function.	Plasma membranes control the substances that move in and out of cells, and so a knowledge of how they work is essential for all areas of biology involving cellular processes.	Cell division explores two processes by which cells divide: mitosis and meiosis. An understanding of these processes and how they can go wrong will help you understand health and disease, as well as explore new technologies in genetics and cloning.	Exchange surfaces explore the need for specialised exchange surfaces, and what makes an effective one. You will learn about the mammalian gaseous exchange system and the interrelationships between the volume of the lungs and the rate of breathing. You will also compare the gas exchange surfaces with those of insects and fish.	Transport in plants describes the key transport systems in plants. You will learn how both the supply of nutrients from the soil and the movement of products of photosynthesis around the plant depends on the flow of water through the vascular system, made up of the xylem and the phloem.	Transport in animals explains why, as animals become larger and more active, transport systems become essential to supply nutrients and oxygen to and waste products from individual cells. The key role of the blood, the blood vessels, and the heart in this transport are fully explored including the electrical control of the heart beat and how this can be recorded using an ECG.	Classification and evolution introduces you to the current system of classification used by scientists. It also explains historically how organisms were classified, and why the system has changed as our knowledge of the biology of organisms has improved. It also covers how organisms are adapted to their environment and how, as a result of naturally occurring evolution, organisms have evolved, and	Biodiversity is an important indicator in the study of habitats. You will learn how to sample habitats to measure and monitor biodiversity, as well as how to maintain biodiversity for ecological, economical and aesthetic reasons.	Communicable disease explores how organisms are surrounded by pathogens and have evolved defences against them. You will discover how plants defend themselves and the role of the mammalian defence system. You will also learn how medical interventions can be used to support these natural defences, such as vaccinations and antibiotics.
Skills: Included here is the specific skills your child will learn in detail	Module 2: <ul style="list-style-type: none"> Describe the main sub-cellular structures of prokaryotic and prokaryotic cells Describe the cell cycle Describe cell differentiation Explain the mechanism of enzyme action Describe some anabolic and catabolic processes in living organisms Change the subject of an equation, when calculating magnification Converting units Working in standard form 					Module 3: <ul style="list-style-type: none"> Calculate surface area: volume ratio Explain the role of the components of blood Describe the processes of transpiration and translocation Recognise appropriate units in calculations Use expressions in decimal and standard form Use ratios, fractions and percentages Estimate results 			Module 4: <ul style="list-style-type: none"> Calculate standard deviation Use the student t-test to compare means of data sets Use the correlation coefficient for two sets of data Use Simpson's index of diversity to measure biodiversity Calculate the proportion of polymorphic gene loci 			
Home learning online platform	Seneca Biology OCR A											
	Assessment 2 - As level mock papers (2 papers)											