Exam Board/Syllabus-OCR (Biology A H420)

Year 12

Year Group	Term	Theme	Topics Teacher 1 Teacher 2	Practical Number (PAG)	Content (8 lessons a fortnight in y12)	Assessment Content
12	1	Cell structure; exchange and transport	Cell structure (2.1), Biological molecules (2.2 1-2.2 10) and Exchange surfaces and breathing (3.1), Transport in animals (3.2 1-3,2 8)	PAG 9 PAG 6 PAG 2	In the first term, the students' previous GCSE knowledge of the structure of the cell is extended. A study of the cell's ultrastructure and a look for evidence using various forms of magnification, is undertaken. The chemical principles behind carbohydrates, lipids and proteins are studied. PAG 9 covers determining glucose concentration. PAG 6 covers separation of amino acids by chromatography. The general underlying ideas behind exchange surfaces are illustrated by an in-depth study of the mammalian gaseous exchange system. Transport in animals is studied by looking at the mammalian cardiovascular system. PAG 2 covers dissection of the heart.	Synoptic tests at the end of each topic ensures that students are constantly reviewing previous topics. Assessments consist of a variety of short answer/long answer questions with a set of multiple-choice questions. Year 12 PPE exams
	2	Biological molecules; transport in plants	Biological molecules (2.2 11- 2.2 14), Nucleic acids (2.3 1-2.3 3), Enzymes (2.4 1-2.4 5) and Transport in plants (3.3 1-3.3 7), Communicable diseases (4.1 1- 4.1 4)	PAG 4 PAG 10 PAG 5	In term 2, students continue to study the topic of biological molecules by considering inorganic ions and undertaking several lab-based practical biochemistry techniques. The important topic of DNA is studied in a section on its own and a start is made on the topic of enzymes, encompassing what they are and the effects of different parameters on their mode of action. PAG 4 covers the effect of substrate concentration on catalase activity. PAG 10 covers DNA structure using RasMol. Transport in plants is covered by studying the tissues involved and the routes taken, both by water and organic solutes. A start is made on communicable diseases by looking at organisms that cause disease and primary defences against such pathogens. PAG 5 covers using a Potometer.	
	3	Enzymes; biological membranes; communicable	Enzymes (2.4 6-2.4 9), Biological membranes (2.5 1-2.5 5) and	PAG 8 PAG 3	In term 3, students complete the study of enzymes by looking at both the effect of concentration and inhibitors on their mode of action. Biological membranes, both at the cell surface and internally, with	

		diseases, biodiversity	Communicable diseases (4.1 5-4.1 9), Biodiversity (4.2 1-4.2 5)		reference to the fluid-mosaic model of membrane structure, are covered. PAG 8 covers finding the water potential of onion tissue. Communicable diseases are completed by studying secondary lines of defence. A start is made on biodiversity by studying practical approaches to this topic. PAG 3 covers quantitative analysis of the distribution of species in a habitat.	
	4	Cell division, cell diversity and cell differentiation; biodiversity; classification and evolution,	Cell division, cell diversity and cell differentiation (2.6 1-2.6 9), Classification and evolution (4.3 6-4.3 9) and Biodiversity (4.2 6-4.2 9), Classification and evolution (4.3 1-4.3 5)	PAG 1	In term 4, students study, in detail, mitosis, meiosis and the cell cycle. They then move on to look at cell diversity, tissues, organs and organ systems. PAG 1 covers observing stages in mitosis. Biodiversity is completed by studying the importance of maintaining biodiversity and by outlining different ways to tackle this problem. The topic covering classification and evolution is completed by both teachers and includes ideas such as different forms of classification, evidence for natural selection and its effect on evolution, variation and the important part played by statistical techniques in eliciting valid information from variation data.	
	5	Preparation for year 12 PPEs; year 12 PPEs; thorough review of year 12 work	Preparation for year 12 PPEs, year 12 PPEs, thorough review of year 12 work		In term 5, students prepare for their year 12 PPE by following a planned revision programme, together with exam practice of past questions. Any PAGs that have been missed, during the previous year, will be included during this time, together with a focussed re-cap of all practical work.	
	6	Start of year 13 work. Ecosystems; populations and sustainability; Scotney Castle field trip; maths for biology	Start of year 13 work. Ecosystems (6.5 1-6.5 6) and Populations and sustainability (6.6 1-6.6 6) Scotney Castle field trip, Maths for biology	Field work at Scotney Castle, PAG 3	In term 6, students will begin year 13 work. They study the ecology section of module 6. This includes an in-depth look at ecosystems - the transfer and manipulation of biomass, recycling within ecosystems and succession. They will also study populations and sustainability – the way that populations and sustainable development interact. PAG 3 Field work is completed during a trip to Scotney Castle. Interwoven within the term 6 framework is a study of maths for biology.	

Year 13

Year Group	Term	Theme	Topics Teacher 1 Teacher 2	Practical number (PAG)	Content (9 lessons a fortnight in y13)	Assessment Content
13	1	Photosynthesis; respiration; communication and homeostasis; excretion; neuronal communication	Photosynthesis (5.6 1-5.6 6), Respiration (5.7 1-5.7 6) and Communication and homeostasis (5.1 1-5.4 4), Excretion as an example of homeostatic control (5.2 1-5.2 8), Neuronal communication (5.3 1-5.3 3)	PAG 11	In term 1, students cover the two important biochemical processes of photosynthesis and respiration, together with relevant and demanding practical investigations. PAG 11(1) covers investigating the effect of carbon dioxide on the rate of photosynthesis. PAG 11(2) covers a comparison of aerobic and anaerobic respiration. On the physiological side, the students study the need for communication systems and how temperature is controlled within living organisms. Excretion is covered, together with a detailed look at how both the liver and kidney perform their functions. Modern methods of coping with kidney failure are discussed. An introduction to neuronal communication is begun, including the formation and transmission of action potentials along a neurone.	Synoptic tests at the end of each topic ensures that students are constantly reviewing previous topics. Assessments consist of a variety of short answer/long answer questions with a set of multiple-choice questions. Y13 PPE exams
	2	Respiration; plant and animal responses; neuronal communication; hormonal communication	Respiration (5.7 7-5.7 9), Plant and animal responses (5.5 1-5.5 11) and Neuronal communication (6.3 1-6.3 4), Hormonal communication (5.4 1-5.4 5)	PAG 12	In term 2, students complete the study of respiration by looking at the energy value of different respiratory substrates, both from a theoretical and practical perspective. PAG 12 covers an investigation into the effect of substrate type on yeast respiration. Plant responses includes the control and practical application of plant growth by means of hormones. Animal responses includes the role of the brain in coordinating responses and the action of muscles. Neuronal communication moves on to study synaptic transmission. Hormonal communication looks at the endocrine system, especially the adrenal glands and the pancreas. Diabetes, causes and treatment, are discussed.	
	3	Cellular control; patterns of inheritance; manipulating genomes; PPE exams	Cellular control (6.1.1-6.1.3), Patterns of inheritance (6.2 1-6.2 3) and Manipulating genomes (6.3 1-6.3 4)		In term 3, students study cellular control, which includes the effects of gene mutations, the regulation of gene expression and the genetic control of body plan development. A start is made on patterns of inheritance by studying both mono- and di- hybrid inheritance. Manipulating genomes begins by looking at gene sequencing and its applications and DNA profiling.	

			Year 13 PPE exams		Year 13 PPE exams take place. Time is allowed for some revision and a period of reflection after the exams.	
	4	Patterns of inheritance; manipulating genomes; cloning and biotechnology	Patterns of inheritance (6.2 4-6.2 14) and Manipulating genomes (6.3 5-6.3 8), Cloning and biotechnology (6.4 1-6.4 9)	PAG 7 PAG 6	In term 4, students complete their study of patterns of inheritance, looking at a variety of different hereditary topics, including autosomal linkage and epistasis. They apply the statistical technique of chi-squared to phenotypic outcomes to assess the type of inheritance being displayed. They use the Hardy-Weinberg principle to calculate allele frequency in populations. Evolution looks at factors affecting it and the role of isolating mechanisms in its development. The continued study of manipulating genomes investigates the polymerase chain reaction, electrophoresis and genetic engineering. Cloning looks at the natural and artificial process of cloning and biotechnology looks at the use of living organisms or parts of living organisms in industrial processes. PAG 7 investigates the effect of antibacterial agents on bacterial growth. PAG 6 covers DNA gel electrophoresis.	
	5	Full revision programme, which includes continued exposure to past exam questions	Full revision programme, which includes continued exposure to past exam questions		In term 5 students follow a full revision programme, covering both year 12 and year 13 work. This will include frequent exposure to past exam questions. A detailed re-cap of practical work takes place and relevant past questions are tackled to help familiarise the students with the way practical work is examined in the final exam.	
	6	All themes.	Review of Y13 work.		Revise and review the content in the course.	