

Biology OCR New Spec BAU AS

2 Lesson Teacher

ACADEMIC YEAR **2017/2018**

TUTOR/S RESPONSIBLE FOR SCHEME MY

TUTOR/S RESPONSIBLE FOR TEACHING MY

SPECIFICATION TITLE/NUMBER **OCR GCE Biology**

AVAILABLE TEACHING WEEKS 31

TOPICS COVERED:

Module 2:

2.1.1 Cell Structure
2.1.4 Enzymes
2.1.5 Biological Membranes
2.1.6 Cell Division, cell diversity and cellular organisation

Module 3:

3.1.1 Exchange surfaces
3.1.2 Transport in Animals

Module 4:

4.1.1 Communicable diseases, disease prevention and the immune system

Lesson	TOPIC	RESOURCES	Learning Outcomes		Possible homeworks
1.1	Introduction 2.1.1 Cell Structure Microscopes Making drawings of slides Microscope Calculations	- INTRO - Get to know you games Pages 3-7 of notes Pages 8-12 of notes Pages 14-20 of notes	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(a) the use of microscopy to observe and investigate different types of cell and cell structure in a range of eukaryotic organisms (b) the preparation and examination of microscope slides for use in light microscopy (c) the use of staining in light microscopy (d) the representation of cell structure as seen under the light microscope using drawings and annotated diagrams of whole cells or cells in sections of tissue (e) the use and manipulation of the magnification formula (f) the difference between magnification and resolution	Prep <input type="checkbox"/> Comp <input type="checkbox"/> HW1: Exam Questions on microscope calculations

1.2	<p>Ultrastructure of cells</p> <p>Ultra structure of cells and poster activity</p> <p>Division of labour (proteins)</p> <p>Cytoskeleton</p> <p>Comparison of prokaryotic and eukaryotic cells</p>		<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	<p>(g) the ultrastructure of eukaryotic cells and the functions of the different cellular components</p> <p>(h) photomicrographs of cellular components in a range of eukaryotic cells</p> <p>(i) the interrelationship between the organelles involved in the production and secretion of proteins</p> <p>(j) the importance of the cytoskeleton</p> <p>(k) the similarities and differences in the structure and ultrastructure of prokaryotic and eukaryotic cells.</p>	<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	
2.1	Recap of Organelles	Pages 22-33 of notes	<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	End of topic exam questions from text book	<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	
2.2	<p>2.1.5</p> <p>Biological Membranes</p> <p>Fluid Mosaic Model</p> <p>Effect of Solvents and Temperature on the cell surface membrane</p>	144 – 149 of notes Pages 153-157	<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	<p>(a) the roles of membranes within cells and at the surface of cells</p> <p>(b) the fluid mosaic model of membrane structure and the roles of its components</p> <p>c) (i) factors affecting membrane structure and permeability (ii) practical investigations into factors affecting membrane structure and permeability</p>	<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	HW2: End of topic exam questions.

3.1	Movement of molecules across membranes		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(d) (i) the movement of molecules across membranes (ii) practical investigations into the factors affecting diffusion rates in model cells Osmosis e) (i) the movement of water across membranes by osmosis and the effects that solutions of different water potential can have on plant and animal cells (ii) practical investigations into the effects of solutions of different water potential on plant and animal cells.	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
3.2	CONSOLIDATION AND PAST PAPERS		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	EXAM QUESTION PACK FOR CELL ORGANELLES AND MEMBRANES – FIND QUESTIONS FROM BREADTH AND DEPTH PAPERS	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	Exam Questions from notes

4.1	2.1.2 Biological Molecules Water Carbohydrates		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(a) how hydrogen bonding occurs between water molecules, and relate this, and other properties of water, to the roles of water for living organisms (b) the concept of monomers and polymers and the importance of condensation and hydrolysis reactions in a range of biological molecules (c) the chemical elements that make up biological molecules (d) the ring structure and properties of glucose as an example of a hexose monosaccharide and the structure of ribose as an example of a pentose monosaccharide (e) the synthesis and breakdown of a disaccharide and polysaccharide by the formation and breakage of glycosidic bonds	Prep <input type="checkbox"/> Comp P <input type="checkbox"/>	
4.2	Carbohydrates continued		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(f) the structure of starch (amylose and amylopectin), glycogen and cellulose molecules (g) how the structures and properties of glucose, starch, glycogen and cellulose molecules relate to their functions in living organisms	Prep <input type="checkbox"/> Comp P <input type="checkbox"/>	SEND THROUGH REQUEST TO OSMAN

5.1	Fats	P158-156	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(h) the structure of a triglyceride and a phospholipid as examples of macromolecules (i) the synthesis and breakdown of triglycerides by the formation (esterification) and breakage of ester bonds between fatty acids and glycerol (j) how the properties of triglycerides, phospholipids and cholesterol relate to their function in living organisms.	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
5.2	Proteins	Pages 163-116	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	k) the general structure of an amino acid (l) the synthesis and breakdown of dipeptides and polypeptides, by the formation and breakage of peptide bonds (m) the levels of protein structure (n) the structure and function of globular proteins including a conjugated protein (o) the properties and functions of fibrous proteins	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	HW: (p) the key inorganic ions that are involved in biological processes

6.1	Chemical Tests for biological molecules Colorimetry		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(q) how to carry out and interpret the results of the following chemical tests: • biuret test for proteins • Benedict’s test for reducing and non-reducing sugars • reagent test strips for reducing sugars • iodine test for starch • emulsion test for lipids (r) quantitative methods to determine the concentration of a chemical substance in a solution (s) (i) the principles and uses of paper and thin layer chromatography to separate biological molecules / compounds (ii) practical investigations to analyse biological solutions using paper or thin layer chromatography.	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
6.2	MOCK EXAM		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
7.1	Go through MOCK exam					

7.2	2.1.3 Nucleic acids DNA and RNA DNA structure and replication			(a) the structure of a nucleotide as the monomer from which nucleic acids are made (b) the synthesis and breakdown of polynucleotides by the formation and breakage of phosphodiester bonds (c) the structure of ADP and ATP as phosphorylated nucleotides (d) (i) the structure of DNA (deoxyribonucleic acid) (ii) practical investigations into the purification of DNA by precipitation (e) semi-conservative DNA replication		PAG 5:
Hols Oct Half Term			Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
8.1	Protein Synthesis Transcription and Translation	Pages 113-118 of notes	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(f) the nature of the genetic code (g) transcription and translation of genes resulting in the synthesis of polypeptides.	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	

8.2	2.1.4 Enzymes Mechanism of enzyme action	Pages 119-127	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(a) the role of enzymes in catalysing reactions that affect metabolism at a cellular and whole organism level (b) the role of enzymes in catalysing both intracellular and extracellular reactions (c) the mechanism of enzyme action	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
9.1	Factors effecting enzyme controlled reactions pH and Temperature	Pages 127-133	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(d) (i) the effects of pH, temperature, enzyme concentration and substrate concentration on enzyme activity	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
9.2	Effect of enzyme and substrate concentration		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	d) (i) the effects of pH, temperature, enzyme concentration and substrate concentration on enzyme activity	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
10.1	Coenzymes, Cofactors and Prosthetic Groups Inhibitors	134-139	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(e) the need for coenzymes cofactors and prosthetic groups in some enzyme-controlled reactions (f) the effects of inhibitors on the rate of enzyme controlled reactions.	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	Metabolic poisons – get students to write the key points for each poison and then answer the questions in the notes.

10.2	REVISION OF 2.1.3		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp p <input type="checkbox"/>	
11.1	2.1.6: Cell division, cell diversity and cellular organisation The Cell Cycle Mitosis	167-174	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(a) the cell cycle (b) how the cell cycle is regulated (c) the main stages of mitosis	Prep <input type="checkbox"/> Comp p <input type="checkbox"/>	Mitosis Exam Questions from notes
11.2	PAG 1		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(d) sections of plant tissue showing the cell cycle and stages of mitosis	Prep <input type="checkbox"/> Comp p <input type="checkbox"/>	

12.1	Meiosis	180-184	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(e) the significance of mitosis in life cycles (f) the significance of meiosis in life cycles (g) the main stages of meiosis	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
12.2	Specialised Cells and Tissues	185 - 190	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(h) how cells of multicellular organisms are specialised for particular functions (i) the organisation of cells into tissues, organs and organ systems	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
13.1	Stem Cells	191-197	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(j) the features and differentiation of stem cells (k) the production of erythrocytes and neutrophils derived from stem cells in bone marrow (l) the production of xylem vessels and phloem sieve tubes from meristems (m) the potential uses of stem cells in research and medicine.	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
13.2	MOCK		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	

14.1	Going through Mock		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
14.2	Revision and discussion of Christmas HW		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
Hols Winter			Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
15.1	3.1.1 Exchange and Transport Components of the mammalian gas exchange system Ventilation	-	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(a) the need for specialised exchange surfaces (b) the features of an efficient exchange surface (c) the structures and functions of the components of the mammalian gaseous exchange system (d) the mechanism of ventilation in mammals	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	

15.2	Lung Volumes and the spirometer Ventilation in bony Fish and Insects		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(e) the relationship between vital capacity, tidal volume, breathing rate and oxygen uptake f) the mechanisms of ventilation and gas exchange in bony fish and insects (g) the dissection, examination and drawing of the gaseous exchange system of a bony fish and/or insect trachea	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
16.1			Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(a) the need for transport systems in multicellular animals (b) the different types of circulatory systems (c) the structure and functions of arteries, arterioles, capillaries, venules and veins (d) the formation of tissue fluid from plasma	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
16.2	3.1.2 Transport in Animals Circulatory System Formation of Tissue Fluid		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(e) (i) the external and internal structure of the mammalian heart (ii) the dissection, examination and drawing of the external and internal structure of the mammalian heart	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	

17.1	<p>External and internal Features of the Heart</p> <p>Cardiac Cycle</p> <p>ECG</p>		<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	<p>(f) the cardiac cycle (g) how heart action is initiated and coordinated (h) the use and interpretation of electrocardiogram (ECG) traces</p>	<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	Dissection of Mammalian Heart
17.2	Haemoglobin and Dissociation Curves	-	<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	<p>(i) the role of haemoglobin in transporting oxygen and carbon dioxide (j) the oxygen dissociation curve for fetal and adult human haemoglobin</p>	<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	
18.1	<p>3.1.3 Transport in Plants</p> <p>Xylem and Phloem</p>		<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	<p>(a) the need for transport systems in multicellular plants (b) (i) the structure and function of the vascular system in the roots, stems and leaves of herbaceous dicotyledonous plants (ii) the examination and drawing of stained sections of plant tissue to show the distribution of xylem and phloem (iii) the dissection of stems, both longitudinally and transversely, and their examination to demonstrate the position and structure of xylem vessels</p>	<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	

18.2	<p>Transpiration and the factors that effect transpiration rate</p> <p>Xerophytes</p> <p>Translocation</p>		<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	<p>(c) (i) the process of transpiration and the environmental factors that affect transpiration rate (ii) practical investigations to estimate transpiration rates (d) the transport of water into the plant, through the plant and to the air surrounding the leaves (e) adaptations of plants to the availability of water in their environment (f) the mechanism of translocation V</p>	<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	
19.1	MOCK		<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>		<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	
19.2	Going through the mock		<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>		<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	

20.1	<p>4.1 Communicable diseases, disease Prevention and the immune system</p> <p>Diseases</p>		<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	<p>(a) the different types of pathogen that can cause communicable diseases in plants and animals To include, • bacteria – tuberculosis (TB), bacterial meningitis, ring rot (potatoes, tomatoes) • virus – HIV/AIDS (human), influenza (animals), Tobacco Mosaic Virus (plants) • protoctista – malaria, potato/tomato late blight, • fungi – black sigatoka (bananas), ring worm (cattle), athlete’s foot (humans).</p>	<p>Prep <input type="checkbox"/></p> <p>Comp P <input type="checkbox"/></p>	
20.2	<p>Transmission of pathogens</p> <p>Plant Defences against pathogens</p>		<p>Prep <input type="checkbox"/></p> <p>Comp <input type="checkbox"/></p>	<p>(b) the means of transmission of animal and plant communicable pathogens (c) plant defences against pathogens</p>	<p>Prep <input type="checkbox"/></p> <p>Comp P <input type="checkbox"/></p>	

Hols Spring Half Term			Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
21.1	The primary defence		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(d) the primary non-specific defences against pathogens in animals (ii) examination and drawing of cells observed in blood smears	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
21.2	Phagocytosis Specific Immune Response B and T lymphocytes		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	f) the structure, different roles and modes of action of B and T lymphocytes in the specific immune response	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
22.1	Antibodies Primary vs Secondary Immune Response		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(g) the primary and secondary immune responses (h) the structure and general functions of antibodies (i) an outline of the action of opsonins, agglutinins and anti-toxins	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	

22.2	Active and Artificial Immunity Vaccination		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(j) the differences between active and passive immunity, and between natural and artificial immunity (k) autoimmune diseases (l) the principles of vaccination and the role of vaccination programmes in the prevention of epidemics	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
23.1	Development and the use of drugs		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(m) possible sources of medicines (n) the benefits and risks of using antibiotics to manage bacterial infection.	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
23.2	4.2.1 Biodiversity Sampling Species Richness and Evenness (including		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(a) how biodiversity may be considered at different levels (b) (i) how sampling is used in measuring the biodiversity of a habitat and the importance of sampling (ii) practical investigations collecting random and non-random samples in the field (c) how to measure species richness and species evenness in a habitat d) the use and interpretation of Simpson's Index of Diversity (D) to calculate the biodiversity of a habitat (e) how genetic biodiversity may be assessed, including calculations	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	

24.1	MOCK		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
24.2	Going through the mock		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
25.1	Factors Affecting Biodiversity Ex situ and In situ conservation	-	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	f) the factors affecting biodiversity (g) the ecological, economic and aesthetic reasons for maintaining biodiversity (h) in situ and ex situ methods of maintaining biodiversity (i) international and local conservation agreements made to protect species and habitats.	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	

25.2	4.2.1 Classification and Evolution Taxonomic hierarchy 5 kingdoms vs 3 domains		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(a) the biological classification of species (b) the binomial system of naming species and the advantage of such a system (c) (i) the features used to classify organisms into the five kingdoms: Prokaryotae, Protoctista, Fungi, Plantae, Animalia (ii) the evidence that has led to new classification systems, such as the three domains of life, which clarifies relationships	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
Hols Easter			Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
26.1	Evolution by Natural Selection Variations and adaptations		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	(d) the relationship between classification and phylogeny (e) the evidence for the theory of evolution by natural selection (f) the different types of variation (g) the different types of adaptations of organisms to their environment (h) the mechanism by which natural selection can affect the characteristics of a population over time (i) how evolution in some species has implications for human populations.	Prep <input type="checkbox"/> Comp <input type="checkbox"/>	

26.2	PAG Completion		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Com p <input type="checkbox"/>	
27.1	PAG Completion		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Com p <input type="checkbox"/>	
27.2	PAG Completion		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Com p <input type="checkbox"/>	
28.1	REVISION		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Com p <input type="checkbox"/>	

28.2	REVISION		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
29.1	REVISION		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
29.2	REVISION		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
30.1	REVISION		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	

30.2	REVISION		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
31.1	REVISION		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	
31.2	REVISION		Prep <input type="checkbox"/> Comp <input type="checkbox"/>		Prep <input type="checkbox"/> Comp <input type="checkbox"/>	