Personalised Learning Checklists Edexcel Combined: Biology Paper 2

Edexcel (combined) Biology Topics (1SC0) from 2016 - Paper 2 (Topic 1)				
Topic	**Student Checklist**	**R**	**A**	**G**
Topic 1 – Key concepts in biology	Explain how the sub-cellular structures of eukaryotic and prokaryotic cells are related to their functions, including: animal, plant & bacteria			
	Explain how specialised cells are adapted to their functions, including: sperm, egg and ciliated epithelial cells			
	Explain how changes in microscope technology, including electron microscopy, have enabled us to see cell structures with more clarity and detail than in the past			
	Demonstrate an understanding of number, size and scale, including the use of estimations and explain when they should be used			
	Demonstrate an understanding of the relationship between quantitative units in relation to cells, including: milli, micro, nano & pico			
	HT ONLY: Complete calculations with numbers written in standard form			
	Core Practical: Investigate biological specimens using microscopes, including magnification calculations and labelled scientific drawings from observations			
	Explain the mechanism of enzyme action including the active site and enzyme specificity			
	Explain how enzymes can be denatured due to changes in the shape of the active site			
	Explain the effects of temperature, substrate concentration and pH on enzyme activity			
	Core Practical: Investigate the effect of pH on enzyme activity			
	Demonstrate an understanding of rate calculations for enzyme activity			
	Demonstrate an understanding of rate calculations for enzyme activity			
	Explain the importance of enzymes as biological catalysts in the synthesis and breakdown of carbohydrates, fats and proteins			
	Explain how substances are transported into and out of cells, including by diffusion, osmosis and active transport			
	Core Practical: Investigate osmosis in potatoes			
	Calculate percentage gain and loss of mass in osmosis			

Edexcel (combined) Biology Topics (1SC0) from 2016 - Paper 2 (Topics 6&7)				
Topic	**Student Checklist**	**R**	**A**	**G**
Topic 6 – Plant structures and their functions	Describe photosynthetic organisms as the main producers of food and therefore biomass			
	Describe photosynthesis in plants and algae as an endothermic reaction and recall the reactants and products			
	Explain the effect of temperature, light intensity and carbon dioxide concentration as limiting factors on the rate of photosynthesis			
	HT ONLY: Explain the interactions of temperature, light intensity and carbon dioxide concentration in limiting the rate of photosynthesis			
	Core Practical: Investigate the effect of light intensity on the rate of photosynthesis			
	HT ONLY: Explain how the rate of photosynthesis, including the use of the inverse square law calculation			
	Explain how the structure of the root hair cells is adapted to absorb water and mineral ions			
	Explain how the structures of the xylem and phloem are adapted to their function in the plant			
	Describe how water and mineral ions are transported through the plant by transpiration, including the structure and function of the stomata			
	Describe how sucrose is transported around the plant by translocation			
	Explain the effect of environmental factors on the rate of water uptake by a plant			
	Demonstrate an understanding of rate calculations for transpiration			
Topic 7 – Animal coordination, control and homeostasis	Recall where different hormones are produced and how they are transferred to their target organs			
	HT ONLY: Explain where adrenalin is produced and how it prepares the body for fight or flight			
	HT ONLY: Explain how thyroxine controls metabolic rate as an example of negative feedback			
	Describe the stages of the menstrual cycle, including the roles of the hormones oestrogen and progesterone, in the control of the menstrual cycle			
	HT ONLY: Explain the interactions of oestrogen, progesterone, FSH and LH in the control of the menstrual cycle			
	Explain how hormonal contraception influences the menstrual cycle and prevents pregnancy			
	Evaluate hormonal and barrier methods of contraception			
	HT ONLY: Explain the use of hormones in Assisted Reproductive Technology (ART) including IVF and clomifene therapy			
	Explain the importance of maintaining a constant internal environment in response to internal and external change			
	HT ONLY: Explain how blood glucose concentration is regulated by glucagon			
	Explain how the hormone insulin controls blood glucose concentration			
	Explain the cause of type 1 diabetes and how it is controlled			
	Explain the cause of type 2 diabetes and how it is controlled			
	Evaluate the correlation between body mass and type 2 diabetes including waist: hip calculations and BMI, using the BMI equation			

Edexcel (combined) Biology Topics (1SC0) from 2016 - Paper 2 (Topics 8&9)				
Topic	**Student Checklist**	**R**	**A**	**G**
Topic 8 – Exchange and transport in animals	Describe the need to transport substances into and out of a range of organisms, including oxygen, carbon dioxide, water, dissolved food molecules, mineral ions and urea			
	Explain the need for exchange surfaces and a transport system in multicellular organisms including the calculation of surface area: volume ratio			
	Explain how alveoli are adapted for gas exchange by diffusion between air in the lungs and blood in capillaries			
	Explain how the structure of the blood is related to its function: red blood cells (erythrocytes), white blood cells (phagocytes and lymphocytes), plasma and platelets			
	Explain how the structure of the blood vessels is related to their function			
	Explain how the structure of the heart and circulatory system is related to its function, including the role of major blood vessels, valves and thickness of chamber walls			
	Describe cellular respiration as an exothermic reaction which occurs continuously in living cells to release energy for metabolic processes, including aerobic and anaerobic respiration			
	Compare the process of aerobic respiration with the process of anaerobic respiration			
	Core Practical: Investigate the rate of respiration in living organisms			
	Calculate heart rate, stroke volume and cardiac output, using the equation cardiac output = stroke volume × heart rate			
Topic 9 – Ecosystems and material cycles	Describe the different levels of organisation from individual organisms, populations, communities, to the whole ecosystem			
	Explain how communities can be affected by abiotic and biotic factors, including: temperature, light, water, pollutants and competition, predation			
	Describe the importance of interdependence in a community			
	Describe how the survival of some organisms is dependent on other species, including parasitism and mutualism			
	Core Practical: Investigate the relationship between organisms and their environment using field-work techniques, including quadrats and belt transects			
	Explain how to determine the number of organisms in a given area using raw data from field-work techniques, including quadrats and belt transects			
	Explain the positive and negative human interactions within ecosystems and their impacts on biodiversity, including: fish farming, non-indigenous species and eutrophication			
	Explain the benefits of maintaining local and global biodiversity, including the conservation of animal species and the impact of reforestation			
	Describe how different materials cycle through the abiotic and biotic components of an ecosystem			
	Explain the importance of the carbon cycle, including the processes involved and the role of microorganisms as decomposers			
	Explain the importance of the water cycle, including the processes involved and the production of potable water in areas of drought including desalination			
	Explain how nitrates are made available for plant uptake, including the use of fertilisers, crop rotation and the role of bacteria in the nitrogen cycle			