

(Triple Science) Biology Paper 2	Confidence Level		
	Red	Amber	Green
<u>Topic 6 – Plant structures and their functions</u>			
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			
<i>Core Practical: Investigate the effect of light intensity on the rate of photosynthesis</i>			
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			
Bio ONLY: Explain how the structure of a leaf is adapted for photosynthesis and gas exchange			
Bio ONLY: Explain how plants are adapted to survive in extreme environments			
Bio ONLY: Explain how plant hormones control and coordinate plant growth and development, including the role of auxins			
<u>Higher Tier Only</u>			
Explain the interactions of temperature, light intensity and carbon dioxide concentration in limiting the rate of photosynthesis			
Explain how the rate of photosynthesis, including the use of the inverse square law calculation			
Describe the commercial uses of auxins, gibberellins and ethene in plants			
<u>Topic 7 – Animal coordination, control and homeostasis</u>			
Recall where different hormones are produced and how they are transferred to their target organs			
Describe the stages of the menstrual cycle, including the roles of the hormones oestrogen and progesterone, 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			
Explain the importance of maintaining a constant internal environment in response to internal and external change			
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			
Bio ONLY: Explain the importance of homeostasis, including: thermoregulation – effect on enzyme activity and osmoregulation – effect on animal cells			
Bio ONLY: Explain how thermoregulation takes place, with reference to the function of the skin			
Bio ONLY: Explain how thermoregulation takes place, with reference to: shivering			
Bio ONLY: Describe the structure of the urinary system			

Bio ONLY: Explain how the structure of the nephron is related to its function in filtering the blood and forming urine			
Bio ONLY: Describe the treatments for kidney failure, including kidney dialysis and organ donation			
Bio ONLY: Recall what urea is produced from and where this occurs in the body			
Higher Tier Only			
Explain where adrenalin is produced and how it prepares the body for fight or flight			
Explain how thyroxine controls metabolic rate as an example of negative feedback			
Explain the interactions of oestrogen, progesterone, FSH and LH in the control of the menstrual cycle			
Explain the use of hormones in Assisted Reproductive Technology (ART) including IVF and clomiphene therapy			
Explain how thermoregulation takes place, with reference to: vasoconstriction and vasodilation			
Explain how blood glucose concentration is regulated by glucagon			
Explain the effect of ADH on the permeability of the collecting duct in regulating the water content of the blood			
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			
<i>Core Practical: Investigate the rate of respiration in living organisms</i>			
Calculate heart rate, stroke volume and cardiac output, using the equation cardiac output = stroke volume × heart rate			
Bio ONLY: Describe the factors affecting the rate of diffusion, including surface area, concentration gradient and diffusion distance			
Bio ONLY: Calculate the rate of diffusion using Fick's law: rate of diffusion = surface area × concentration difference / membrane thickness of membrane			
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			

<i>Core Practical: Investigate the relationship between organisms and their environment using field-work techniques, including quadrats and belt transects</i>			
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			
Bio ONLY: Explain the effects of temperature, water content and oxygen availability on the rate of decomposition in food preservation			
Bio ONLY: Explain the effects of temperature, water content and oxygen availability on the rate of decomposition in composting			
Bio ONLY: Calculate rate changes in the decay of biological material			
Bio ONLY: Explain how some energy is transferred to less useful forms at each trophic level and that this affects the number of organisms at each trophic level			
Bio ONLY: Calculate the efficiency of energy transfers between trophic levels and percentage calculations of biomass			
Bio ONLY: Describe the biological factors affecting levels of food security			
<u>Higher Tier Only</u>			
Evaluate the use of indicator species as evidence to assess the level of pollution, for: polluted water and air quality			