



AQA GCSE Combined Science: Trilogy

Topic Checklists **4.4 Bioenergetics**

4.4.1 Photosynthesis

Topic	Success Criteria	Progress		
Photosynthetic Reaction	I can write a word equation to represent photosynthesis.			
	I can name the substances represented by the chemical symbols CO_2 , H_2O , O_2 and $\text{C}_6\text{H}_{12}\text{O}_6$.			
	I can explain why photosynthesis is an endothermic reaction.			
Rate of Photosynthesis	I can explain the effect of the following factors on the rate of photosynthesis: <ul style="list-style-type: none"> • temperature; • light intensity; • carbon dioxide concentration; • amount of chlorophyll. 			
	I can describe an experiment to investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed (required practical activity 5).			
	I can measure and calculate rates of photosynthesis.			
	I can extract and interpret graphs of photosynthetic rate involving one limiting factor.			
	I can plot and draw appropriate graphs, selecting an appropriate scale for axes.			
	(HT only) I can explain graphs of photosynthesis rate involving two or three factors and decide which is the limiting factor.			
	(HT only) I can use inverse proportion – the inverse square law and light intensity in the context of photosynthesis.			
	(HT only) I can explain why limiting factors are important in the economics of enhancing the conditions in greenhouses.			
Uses of Glucose from Photosynthesis	I can describe some ways that the glucose produced in photosynthesis may be used.			
	I can explain how plants produce proteins.			

**4.4.2 Respiration**

Topic	Success Criteria	Progress		
Aerobic and Anaerobic Respiration	I can explain why cellular respiration is an exothermic reaction.			
	I can explain how the energy transferred by respiration in cells is used by the organism.			
	I can compare the processes of aerobic and anaerobic respiration with regard to the need for oxygen, the differing products and the relative amounts of energy transferred.			
	I can write a word equation to represent aerobic respiration.			
	I can name the substances represented by the chemical symbols $C_6H_{12}O_6$, O_2 , CO_2 and H_2O .			
	I can write a word equation to represent anaerobic respiration in muscles.			
	I can explain the difference in the amount of energy transferred in anaerobic respiration compared to aerobic respiration.			
	I can write a word equation to represent anaerobic respiration in plant and yeast cells.			
	I can describe some commercial uses of anaerobic respiration in yeast cells (fermentation).			
Response to Exercise	I can describe how the human body reacts to the increased demand for energy during exercise.			
	I can explain what type of respiration takes place if insufficient oxygen is supplied and the effect this has on muscles.			
	(HT only) I can describe what happens to accumulated lactic acid after exercise.			
	(HT only) I can give a definition for the term 'oxygen debt'.			
Metabolism	I can explain the importance of sugars, amino acids, fatty acids and glycerol in the synthesis and breakdown of carbohydrates, proteins and lipids.			
	I can give a definition for the term 'metabolism'.			
	I can give some examples of metabolism in living organisms.			