Long Term Plan: Biology Year 9

ARCHBISHOP SENTAMU ACADEMY
CHURCH OF ENGLAND

Half term	Unit title	Key knowledge/ Content to learn and retain	Essential skills to acquire (subject & generic)	Link to subject ethos and driver (rename)	Anticipated misconceptions	Links to previous KS	Links to future KS	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital	Career Link
One	Transporting Substances	The need for exchange surfaces and the human respiratory system The heart and circulatory system, including coronary heart disease Gas exchange in plants, transport with the xylem and phloem	Drawing and labelling scientific diagrams Recording and interpreting data in tabular and graphical form Interpreting data to comment on risk factors for Non-communicable diseases Carry out practical investigation and record accurate data		The concept of plants "breathing" That human blood is blue when deoxygenated Potential for confusion between the functions of the xylem and the phloem	The year three program of study includes plants and what plants need in order to grow, also builds on the interdependence unit studied in year eight Developed further study of circulatory and respiratory system from year eight	Lays the foundation for study of the organisation unit at GCSE Study of bioenergetics and factors affecting photosynthesis GCSE required practical: The use of osmosis to determine the sucrose concentration of potato cells	High Prior attainers can attempt to draw the osmosis graph without scaffolding Comparison of factors affecting Transpiration Adaptation of the respiratory system, including adaptations of alveoli to increase the rate of diffusion	Risk factors for coronary heart disease The risks and impact of smoking on the human respiratory system	Different kinds of plants, including those not found in hall and there is not native to the United Kingdom	A multitude of careers within the health sciences Sports science and physiotherapy Medical and health-based research Farmer Conservationist A multitude of careers for government organisations

											such as the environment agency and Department for agriculture and rural affairs
Two	Transporting Substances	Transpiration and factors affecting transpiration Diffusion and osmosis, including investigating cell concentrations using osmosis	Safety carry out scientific investigation using live samples, recording accurate data Representing information on a graph Extrapolating line of best fit		Potential for confusion between transpiration and translocation Potential for confusion between osmosis and diffusion	The year three program of study includes plants and what plants need in order to grow, also builds on the interdependence unit studied in year eight	Lays the foundation for study of the organisation unit at GCSE Study of bioenergetics and factors affecting photosynthesis GCSE required practical: The use of osmosis to determine the sucrose concentration of potato cells	High Prior attainers can attempt to draw the osmosis graph without scaffolding Comparison of factors affecting Transpiration Adaptation of the respiratory system, including adaptations of alveoli to increase the rate of diffusion	Risk factors for coronary heart disease The risks and impact of smoking on the human respiratory system		A multitude of careers within the health sciences Sports science and physiotherapy Medical and health-based research Farmer Conservationist A multitude of careers for government organisations such as the environment agency and Department for agriculture and rural affairs

Three	Digestion and Nutrition	Key nutrient groups, including their functions within the body and the consequences of dietary deficiency Testing for key nutrient groups using simple chemical tests The simple lock and key model of enzymes The function of enzymes in the digestive system Factors that affect the rate of an enzyme controlled reaction	safety carry out simple chemical tests and interpret the results The use of water baths to gently heat solutions Finding the gradient of the line Extrapolating the line of best fit		That digestion starts in the stomach; when it actually starts in the mouth That enzymes can "die" or are killed; rather than denatured. That digestion releases energy from food - rather than breaks down food into smaller molecules	The year 4 programme of study covers the fundamentals of the digestive system.	Organisation topic at GCSE includes digestive system physiology and anatomy. GCSE required practical: Food Tests	Higher Prior attainers can look in more detail at the lock and key model of the enzyme and consider the induced fit model. The use of enzymes in biological cleaning agents How and why the enzymes from different organisms have different optimal conditions	What makes a healthy diet The impact of an unhealthy diet, including the risks associated with obesity	Food from around the world.	Dietician Nutritionist Sport science Food scientist
Four	Digestion and Nutrition	Independent, dependent and control variable The concept of enzyme	Experimental design Collecting data, both qualitative and quantitative		That digestion starts in the stomach; when it actually starts in the mouth	The year 4 programme of study covers the fundamentals of the digestive	Organisation topic at GCSE includes digestive system physiology and anatomy.	Higher Prior attainers can look in more detail at the lock and key model of the enzyme and	What makes a healthy diet The impact of an unhealthy diet, including the risks	Food from around the world.	Dietician Nutritionist Sport science Food scientist

		denaturation The physiology and anatomy of the human digestive system Active transport, including direct comparison of active transport with diffusion	Calculating the mean average and identifying anomalous results Commenting on the accuracy and precision of data presented in both tabular and graphical form		That enzymes can "die" or are killed; rather than denatured. That digestion releases energy from food - rather than breaks down food into smaller molecules	system.	GCSE required practical: Food Tests	consider the induced fit model. The use of enzymes in biological cleaning agents How and why the enzymes from different organisms have different optimal conditions	associated with obesity		
Five	Bioenergetics	Photosynthesis, including the world and symbol equation. Factors that affect the rate of photosynthesis How plants use glucose	writing and balancing chemical equations Graphing data, and interpreting data presented in graphical form Drawing and extrapolating lines of best fit		That plants breathe Students may struggle to link the factors that affect the rate of photosynthesis to the factors that affect the rate of an enzyme controlled	The year three program of study includes learning that plants and make their own food, although students will not have used the term photosynthesis Students were introduced to the idea of photosynthesis in year eight when they	The study of bioenergetics at GCSE How plant structures are adapted for photosynthesis GCSE required practical: investigate the effect of one named variable on the rate of photosynthesis	Students could consider how The optimal conditions for photosynthesis might differ for plants that live in different environments and how this could be achieved biologically Students could link photosynthesis and respiration as	Plants as fundamental to human existence, forming the basis of food chains which support us. The effects of exercise on the body, and why it is important that you are regularly physically active	A deeper understanding for climate and environment in all parts of the world The correct meaning of the term metabolism which is often misused in popular culture	Sport science Sports coaching Physiotherapy Conservationist Botanist Farming Food scientist

						look at plants as the foundation of the most food chains		part of a wider nutrient cycle			
Six	Bioenergetics	Aerobic and anaerobic respiration, including word and symbol equations The effects of exercise on the rate of respiration, with reference to heart and breathing rate Bodily metabolism	writing and balancing chemical equations Graphing data, and interpreting data presented in graphical form Drawing and extrapolating lines of best fit		Confusion between the term respiration and the act of breathing, which should be referred to with the term ventilation	The year three program of study includes learning that plants and make their own food, although students will not have used the term photosynthesis Students were introduced to the idea of photosynthesis in year eight when they look at plants as the foundation of the most food chains	The study of bioenergetics at GCSE How plant structures are adapted for photosynthesis GCSE required practical: investigate the effect of one named variable on the rate of photosynthesis	Students could consider how The optimal conditions for photosynthesis might differ for plants that live in different environments and how this could be achieved biologically Students could link photosynthesis and respiration as part of a wider nutrient cycle	Plants as fundamental to human existence, forming the basis of food chains which support us. The effects of exercise on the body, and why it is important that you are regularly physically active	A deeper understanding for climate and environment in all parts of the world The correct meaning of the term metabolism which is often misused in popular culture	Sport science Sports coaching Physiotherapy Conservationist Botanist Farming Food scientist