SUBJECT CURRICULUM OUTLINE

Term	Topic/Unit of work	Knowledge	Skills	Assessment
Autumn Term 1	3.5.1 Photosynthesis (11 hrs)	The light-dependent reaction The light-independent reaction	**AT a** Students could devise and carry out experiments to investigate the effect of named environmental variables on the rate of photosynthesis using aquatic plants, algae or immobilised algal beads. **AT g and b** **Required practical 7:** Use of chromatography to investigate the pigments isolated from leaves of different plants, eg leaves from shade-tolerant and shade-intolerant plants or leaves of different colours. **Required practical 8:** Investigation into the effect of a named factor on the rate of dehydrogenase activity in extracts of chloroplasts.	RAG Check STAMPS every 2 weeks Exam Week
	3.5.2 Respiration (8 hrs)	Glycolysis Krebs cycle Electron transfer chain Chemiosomotic theory	**AT b** Students could use a redox indicator to investigate dehydrogenase activity. **Required practical 9:** Investigation into the effect of a named variable on the rate of respiration of cultures of single-celled organisms. AT b and i	

	3.5.3 Energy and Ecosystems (5hrs) 3.7.1,3.7.2,3.7.3 Genetics, populations and evolution (17 hrs)	Biomass and calorimetry Gross Primary Production Net Primary Production Primary and secondary productivity The use of natural and artificial fertilisers 3.7.1 Inheritance	**MS 0.1** Students could be given data from which to calculate gross primary production and to derive the appropriate units. **AT a** Students could carry out investigations to find the dry mass of plant samples or the energy released by samples of plant biomass. **MS 2.4** Students could be given data from which to calculate: • the net productivity of producers or consumers from given data • the efficiency of energy transfers within ecosystems. **MS 0.3** Students could be given data from which to calculate percentage yields **PS 1.1** Students could devise investigations into the effect of named minerals on plant growth..	
Autumn Term 2	3.5.4 Nutrient Cycle (5 hrs) 3.6.1 Response to changes in their internal and external environments (16 Hrs)	Nitrogen cycle and the phosphorus cycle. 3.6.1.1 Survival and response 3.6.1.2 Receptors 3.6.1.3 Control of heart rate	**PS 1.1** Students could devise investigations into the effect of named minerals on plant growth. **AT h** Students could design and carry out investigations into the effects of indoleacetic acid on root growth in seedlings. **Required practical 10:**	STAMPS every 2 weeks

	3.7.1,3.7.2,3.7.3 Genetics, populations and evolution (17 hrs)	3.7.2 Populations 3.7.3 Evolution may lead to speciation 3.7.4 Populations in ecosystems	Investigation into the effect of an environmental variable on the movement of an animal using either a choice chamber or a maze. **AT k** Students could: • investigate the distribution of organisms in a named habitat using randomly placed frame quadrats, or a belt transect • use both percentage cover and frequency as measures of abundance of a sessile species. **AT h** Students could use the mark-release-recapture method to investigate the abundance of a motile species. **AT i** Students could use turbidity measurements to investigate the growth rate of a broth culture of microorganisms. **MS 2.5** Students could use a logarithmic scale in representing the growth of a population of microorganisms.	
Spring Term 1	3.6.2 Nervous co-ordination (11 hrs) 3.6.3 Muscles (6 Hrs)	3.6.2.1 Nerve impulses 3.6.2.2 Synaptic transmission 3.6.3 Skeletal muscles are stimulated to contract by nerves and act as effectors	**MS 0.2** Students could use appropriate units when calculating the maximum frequency of impulse conduction given the refractory period of a neurone. **AT d** Students could examine prepared slides of skeletal muscle using an optical microscope. **AT h** Students could investigate the effect of repeated muscular contraction on the rate of muscle fatigue in human vounteers. **AT b and c**	STAMPS every 2 weeks MOCK Exams

	3.8 Contol of Gene Expression (22 hrs)	3.8.1 Alteration of the sequence of bases in DNA can alter the structure of proteins 3.8.2 Gene expression is controlled by a number of features 3.8.2.1 Most of a cell's DNA is not translated		
Spring Term 2	3.6.4 Homestasis (11 Hrs) 3.8 Contol of Gene Expression (22 hrs)	3.6.4 Homeostasis is the maintenance of a stable internal environment 3.6.4.1 Principles of homeostasis and negative feedback 3.6.4.2 Control of blood glucose concentration 3.6.4.3 Control of blood water potential 3.8.2.2 Regulation of transcription and translation 3.8.2.3 Gene expression and cancer 3.8.3 Using genome projects 3.8.4 Gene technologies allow the study and alteration of gene function allowing a better understanding of organism function and the design of new industrial and medical processes 3.8.4.1 Recombinant DNA technology 3.8.4.2 Differences in DNA between individuals of the same species can be exploited for identification and diagnosis of heritable conditions 3.8.4.3 Genetic fingerprinting	**Required practical 11:** Production of a dilution series of a glucose solution and use of colorimetric techniques to produce a calibration curve with which to identify the concentration of glucose in an unknown 'urine' sample.	STAMPS every 2 weeks
Summer Term 1		**Revision**		STAMPS every 2 weeks

				Timed Assessments in class