QPHS Year 13 Biology Curriculum Map

Half term	Title	Unit summary	Assessment
1	T1: Photosynthesis	• The light-dependent reaction including photolysis, photoionisation, photophosphorylation and chemiosmosis. • The light-independent reaction to produce useful organic substances. • Environmental factors that limit the rate of photosynthesis and the impact of these on agricultural practices.	• Assessed homework on photosynthesis and mixed year 12 content. • Required practical 7: Use of chromatography to investigate the pigments from leaves of different plants • Required practical 8: Investigation into the effect of a named factor on the rate of dehydrogenase activity in chloroplasts. • End of topic test on photosynthesis with cumulative content from inheritance and receptors.
	T2: Populations in Ecosystems	• Key principals in ecology including populations, community, habitat, niche and ecosystems. • How to estimate population sizes using quadrats and the mark-release-recapture method. • The stages of succession and conservation of habitats.	• Assessed homework on population and year 12 content cells. • Required practical 12: Investigation into the effect of a named environmental factor on the distribution of a given species. • End of topic test on populations with cumulative content from year 12 cells.
	T2: Energy Transfers and Nutrient Cycles	• Energy transfers and losses through a food chain. • The nitrogen and phosphorus cycle. • The role of different microorganisms in recycling chemical elements.	• Assessed homework on energy transfers and nutrient cycle and year 12 content enzymes • End of topic test on energy transfers and nutrient cycles with cumulative content on populations and enzymes.
2	T1: Respiration	• Aerobic respiration including glycolysis, the link reaction, the Krebs cycle and oxidative phosphorylation. • Anaerobic respiration in animal, plant and yeast cells. • Use of respirometers to measure the rate of respiration.	• Assessed homework on respiration and mixed year 12 content. • Required Practical 9: Investigation into the effect of a named variable on the rate of respiration of cultures of single-celled organisms. • End of topic test on respiration with cumulative content from nerves, inheritance and receptors.
	T2: Homeostasis	• Principles of homeostasis and negative feedback. • Control of blood glucose concentration. • Control of blood water potential.	• Assessed homework on homeostasis and year 12 content DNA and protein synthesis. • Required practical 11: Production of a dilution series of a glucose solution and use of colorimetric techniques to produce a calibration curve. • End of topic test on homeostasis with cumulative knowledge from nutrient cycles, DNA and protein synthesis.
3	T1: Receptors	• Survival and response; Taxes, kinesis, tropisms and simple reflexes. • Receptors; Pacinian corpuscles, rods and cone cells in the retina. • Control of heart rate; electrical activity of the heart and roles of the nervous system in changing heart rate.	• Assessed homework on receptors and year 12 content biological molecules. • Required practical 10: Investigation into the effect of an environmental variable on the movement of an animal using either a choice chamber or maze. • End of topic test on receptors with cumulative content from biological molecules.
	T1: The Nervous System	• The establishment of a resting potential and changes in membrane potential leading to depolarisation. • The passage of an action potential along different axons and factors affecting the speed of conductance. • The structure and role of a synapse.	• Assessed homework on the nervous system and year 12 content the immune system. • End of topic test on the nervous system with cumulative knowledge from receptors and immune system.
	T2: Muscles	• The gross and microscopic structure of a skeletal muscle. • The roles of actin, myosin, calcium ions phosphocreatine and ATP in myofibril contraction. • Slow and fast skeletal muscle fibres.	• Assessed homework on muscles and year 12 variation. • End of topic test on muscles with cumulative knowledge from homeostasis and variation.
4	T1: Inheritance	• Monohybrid and dihybrid crosses involving dominant, recessive and codominant alleles. • Genetic crosses involving sex-linkage, autosomal linkage, multiple alleles and epistasis. • Use of chi-squared test to compare the observed and expected ratios.	• Assessed homework on inheritance and year 12 content digestion and absorption. • End of topic test on inheritance with cumulative knowledge from the nervous system, receptors and digestion and absorption.
	T2: Gene Pools	• Species and populations. • Concepts of gene pool, allele frequency and changes to allele frequency leading to speciation. • The Hardy-Weinberg principle.	• Assessed homework on gene pools and mixed year 12 content. • End of topic test on gene pools with cumulative content from ecosystems and year 12 biodiversity and taxonomy.
	T2: Gene Expression	• Cell specialisation and stem cells • Regulation of transcription and translation • Gene expression and cancer	• Assessed homework on gene expression and mixed year 12 content. • End of topic test on gene expression with cumulative content from muscles and year 12 mass transport in plants.
5	T1: Gene Technology	• Using genome projects, identification and diagnosis and heritable conditions. • Recombinant DNA technology. • Genetic fingerprinting	• Assessed homework on gene technology and year 12 content mass transport in animals. • End of topic test on gene technology with cumulative knowledge from the inheritance, nerves and mass transport.
6	T1 and T2: Revision and exam skills	Students will recap content from the year and review exam skills.	Year 13 A Level examinations.