	Year 13 Biology				
	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term
BIG Q Content *(max 5)* Please log into Seneca to support your child to understand this learning	***How does almost every living organism owe their continued existence to photosynthesis?*** Describe the main stages of photosynthesis. Explain how leaves and chloroplasts are adapted to carry out the light-dependent reaction. Explain how carbon dioxide absorbed by plants is incorporated into organic molecules. Describe the roles of ATP and NADPH in the light-independent reaction. Describe the events in the Calvin Cycle. ***How does the nervous system coordinate communication between receptors and effectors to produce rapid, appropriate responses to stimuli?*** Describe taxes, kinesis and tropisms. Describe the stimuli that plants respond to. Describe and explain plant growth factors in flowering plants. Explain how a simple reflex arc works. Describe the structure of a Pacinian corpuscle and explain how it works. ***How can we use knowledge of inheritance to predict phenotype ratios in offspring?*** Draw genetic diagrams of dominant/recessive monohybrid, dihybrid and codominant crosses to predict offspring genotypes and phenotypes. Apply knowledge to calculate the predicted ratios of genotypes and phenotype of offspring when supplied with appropriate information.	***How do organisms use the glucose produced in photosynthesis to release energy?*** Describe the main stages of glycolysis Outline the nature of the link reaction Explain what happens during the Kreb's cycle Describe the nature of hydrogen carrier molecules and explain their role in the Kreb's cycle. Explain how ATP is synthesised during oxidative phosphorylation and the role of oxygen in aerobic respiration. ***Describe the principles of nervous co-ordination and the control of heart rate in response to changing stimuli?*** Describe how the autonomic nervous system controls heart rate. Describe the different types of neurones. Explain how an action potential can pass along an unmyelinated and myelinated axon. Explain the role of the refactory period. Explain how information is transmitted across a synapse. ***How can we use data to calculate allelic frequency in a population of organisms?*** Draw genetic diagrams of sex linked and autosome linked crosses to predict offspring genotypes and phenotypes. Explain what is meant by epistasis. Define the Hardy-Weinberg principle. Use the Hardy-Weinberg principle to calculate allele, genotype and phenotype frequencies.	***How is energy transferred through a food chain?*** Explain how energy enters a food chain. Explain how energy is transferred between organisms in the ecosystem. Define biomass and explain how it is measured. Calculate the percentage of energy that is transferred from one trophic level to the next. Describe how nitrogen and phosphorous are cycled. ***How do the structure of skeletal muscle and the sliding filament mechanism enable muscles to contract and generate movement?*** Describe the gross and microscopic structure of a skeletal muscle. Explain how actin and myosin are arranged within a myofibril. Explain what is meant by antagonistic muscles and how they operate. Explain how the sliding filament mechanism causes a muscle to contract and relax. Describe where the energy for muscle contraction comes from. ***How do changes in DNA lead to the development of a new species?*** Describe variation in terms of genetic and environmental factors. Describe types of natural selection. Explain the effects of different types of selection. Explain how new species are formed. Describe allopatric and sympatric speciation.	***How is gene expression controlled?*** Describe the types of gene mutations. Explain how transcription and translation is regulated. Explain the effects of epigenetic factors on DNA and histones. Explain how DNA can be cut into fragments and then amplified. Describe the different uses of gene technologies. ***How do negative feedback mechanisms maintain homeostasis in mammals?*** Explain the importance of homeostasis. Explain what negative feedback is and how it helps to control homeostatic processes. Explain the roles of insulin, glucagon and adrenaline in regulating blood glucose. Describe and explain the two main types of diabetes and how they can be controlled. Describe the structure of the mammalian kidney and link to how water potential of the blood is regulated. ***How does an ecosystem develop?*** Describe changes that occur in the variety of species that occupy an area over time. Describe the terms succession and climax community. Explain how managing succession can help to conserve habitats.	***Recall key concepts.*** ***Apply understanding to exam questions***

Vocabulary *(max 10)* Please use your child's knowledge notes to help them learn these definitions	Thylakoids Chemiosmotic theory Ribulose bisphosphate (RuBP) Glycerate 3-phosphate (GP) Triose phosphate (TP) Kinesis Peripheral Nervous System (PNS) Pacinian corpuscle Homozygous Heterozygous	Oxidative phosphorylation Acetyl coenzyme A Electron transfer chain Oxidation-reduction Autonomic Nervous system (ANS) Myelinated Neurotransmitter Schwann cells Epistasis Hardy-Weinberg	Ammonification Nitrification Saprobionts Eutrophication Sarcoplasm Sarcomere Tropomyosin Phosphocreatine Speciation Allopatric	Epigenetics Oncogenes Methylation Reverse transcriptase Restriction endonucleases Glycogenesis Glycogenolysis Gluconeogenesis Osmoregulation Antidiuretic hormone (ADH)	
Catholic Link	Creation & the environment	Creation	Creation & the environment	Dignity & creation	
Careers Link	Genetic counsellor, biomedical scientist, neurologist	Epidemiologist, bioinformatic scientist, neuroscientist	Evolutionary biologist, geneticist Physiotherapist, sports medicine	Conservation scientist, zoologist, nephrologist	

Ways to enrich the Y13 Biology curriculum at home:

- Completion of the revision and exam practise textbook
- Reading news articles relating to Biology
  Design a 'lesson' on something you've been learning about and teach it to someone at home