Long Term Plan – Science 2023-2024 Green

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Blue	**Reproduction and puberty** Female reproduction Male reproduction Puberty Fertilisation and contraception foetus development smoking and pregnancy plant reproduction fertilisation and seed dispersal	**Waves** Longitudinal and transverse waves. Light and sound waves Practical skills – Investigating the angle of incidence and the angle of reflection - Drawing conclusions from experimental results.	**Living things and their interactions** MRS GREN – Criteria of living things. Food chains and food webs Skills – Constructing biological pyramids from given data Competition and adaptation of plants and animals.	**The building blocks of life** Cells, organs and organ systems Bones, the skeleton and its function Joints STEM – Engineering design considerations of making a quality prosthetic limb.	**Conduction, Convection and Radiation** Conduction, convection, and radiation. Practical Skills – Investigating conduction and insulation, absorption, and emission of thermal radiation. Skills – Plotting graphs	**Organs and Organ Systems** The respiratory, digestive, and circulatory systems. Anaerobic and aerobic respiration The immune system Practical Skills – experimental variables and evaluating methods
Green	**Reproduction and puberty** Female reproduction Male reproduction Puberty Fertilisation and contraception foetus development smoking and pregnancy plant reproduction fertilisation and seed dispersal	**Healthy Diet, Healthy Body** Components of a healthy diet and the consequences an unhealthy diet. Diet related diseases GM foods Alcohol and cannabis	**Plants and the Carbon Cycle** Photosynthesis and the carbon cycle. Leaf structure Deforestation. Practical skills – Follow a procedure to test a leaf for starch, risk assessment.	**Forces and Spaces** Forces and their effects Gravity and space travel Our Solar System and the universe. Key stages in space exploration – The scientific process	**Physical, Chemical and Energy Changes** Chemical or physical change Solids, liquids, and gases and changing state. Energy changes. Practical Skills – Investigating the changing state of water, collecting accurate data and plotting graphs.	**Marie Curie and her contribution to science** Marie Curie and the barriers she had to overcome. The structure of the atom. Radiation and its uses Cancer
Y10 GCSE Biology	**Cell Biology** Eukaryotes and prokaryotes Animal and plant cells Cell specialisation Cell differentiation Microscopy Chromosomes Mitosis and the cell cycle Stem cells Transport in cells	**Organisation** Principles of organisation The human digestive system The heart and blood vessels Blood Plant tissues Plant organ systems Required practical – Testing for	**Homeostasis and Response** Structure and function The brain The eye Control of body temperature Human endocrine system Control of blood concentration.	**Reproduction** Asexual and sexual reproduction Meiosis Advantages and disadvantages of sexual and asexual reproduction DNA and the genome DNA structure Genetic inheritance Inherited disorders	**Communicable and non-communicable diseases.** Coronary heart disease Health issues The effect of lifestyles on some non-communicable diseases Cancer Communicable diseases Viral diseases Bacterial diseases	**Bioenergetics** Photosynthesis reaction Use of glucose from photosynthesis Anaerobic and aerobic respiration Response to exercise Metabolism Required practical - Rate of photosynthesis (Investigating the effect

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	Osmosis Active transport Require practical - Culturing microorganisms. Required practice – Light microscope investigation.	carbohydrates, lipids and proteins. Required practical – effect of pH on the rate of reaction of amylase enzymes.	Maintaining water and nitrogen balance in the body. Hormones in human reproduction Contraception Control and coordination (plant hormones) Practical skills - Planning and carrying out an investigation into the effect of a factor on human reaction time.	Sex determination	Fungal diseases Protist diseases Discovery and development of drugs	of light intensity on the using an aquatic organism.) Required practical - Investigate the effect of light or gravity on the growth of newly germinated seedlings.
Y11 GCSE Biology	**Ecosystems** Communities Abiotic factors Biotic factors Adaptations Levels of organisations How materials are cycled Decomposition Required practical - Measure the population size of a common species in a habitat.	**Biodiversity** Biodiversity Waste management Land use Deforestation Global Warming Maintaining biodiversity Trophic levels Pyramids of biomass Transfer of biomass Factors affecting food security. Farming techniques Sustainable fisheries Role of biotechnology Required practical - Investigate the effect of temperature on the rate of decay of fresh milk by measuring pH change.	**Defending Against Pathogens** Human defence systems Vaccinations Antibiotics and painkillers Discovery and development of drugs Detection and identification of plants diseases. Plant defence responses Practical Skills - investigating the effect of antiseptics on bacterial growth.	**Variation and Evolution** Variation Evolution Selective breeding Genetic engineering Cloning Theory of evolution Speciation The understanding of genetics Evidence for evolution Fossil Extinction Resistant bacteria Classification of living organisms	**Revision and Exam prep**	**GCSE Exams**

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Half Termly Career Focus

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Blue	Ultrasound technician	Laboratory technician Cell biologist	Wind turbine technician	Petroleum engineer Epidemiologist	Pharmacologist	Nuclear reactor operator Radiographer
Green	Nurse	Bioengineer	Restoration Ecologist Forensic scientist	Prosthetist	Thermal insulation engineer Analytical Chemist	Engineer
Y10	Laboratory technician	Forensic scientist	Optician	Geneticist	Nurse	Fitness consultant
Y11	Zoologist	Farmer	Doctor	Breeder		