	Term 1	Term 2	Term 3
Y7	**Cells** Students learn about animal and plant cells, specialised cells, unicellular organisms and diffusion. Beginning to use a microscope and learning how they work, preparing simple slides, safely handling chemicals and equipment, using basic laboratory equipment e.g. beakers, stopwatches, drawing labelled diagrams.	**Structure and Function of Body Systems** Organisation in organisms, gas exchange, breathing, skeleton, joints, muscles. Working out how mass affects the force needed to make a muscle work, using Newton meters, recording data in a simple table, drawing labelled diagrams, using new scientific terminology correctly, measuring volumes.	**Reproduction** Adolescence, internal and external fertilisation, human reproductive systems, fertilisation and implantation, development of the foetus, menstrual cycle, plant reproductive systems, fertilisation and germination, seed dispersal. Line and bar graph drawing and error spotting, calculating means and percentages, introducing ideas of accuracy and precision, identifying variables in an investigation, beginning to plan simple methods.
	Term 1	**Term 2**	**Term 3**
Y8	**Health and Lifestyle** Food groups and healthy eating, energy from food, digestive system, enzymes, drugs, alcohol, smoking. Using a Bunsen burner to burn food, food tests and identifying unknowns, following complex instructions, and discussion of lifestyle choices and their negative impacts on health. This topic includes some more extended writing tasks to develop literacy skills, graph drawing.	**Ecosystem Processes** Photosynthesis, structure of a leaf, anaerobic and aerobic respiration, chemosynthesis, fertilisers, food webs and chains, bioaccumulation, population changes and ecosystems. Practical skills revisited including using Bunsen burners and microscopes. New practical techniques of sampling using quadrats, introduction to writing risk assessments, identifying variables, drawing tables. This topic includes some more extended writing tasks to develop literacy skills and drawing labelled diagrams, graph drawing.	**Adaptation and Inheritance** Predator-prey relationships and interdependence, adaptations, variation, DNA, theories of evolution, natural selection and extinction, continuous and discontinuous variation. More extended writing/reading on the history of how scientists worked together to discover DNA, lot of opportunities for discussions and evaluations of scientific theories and evidence for and against them, whilst also gaining an appreciation that there are different religious views too.
	Term 1	**Term 2**	**Term 3**

Y9	**Cell Structure and Transport** Electron microscopes and general microscopy, eukaryotic and prokaryotic cell structure, specialised cell structures, orders of magnitude, roles of diffusion, osmosis and active transport in the movement of materials within and between cells, adaptations to increase the rate of transport in and out of cells. Using microscopes, microscope drawings, calculating magnification, drawing scale bars, making slides, converting between units, surface area to volume ratio calculations, drawing graphs with negative axis and using lines of best fit to make predictions.	**Organising Animals and Plants** Blood, double circulatory system, valves, blood vessels, detailed structure of the heart, gas exchange system in mammals and plants, organisation and transpiration in plants. Observation of heart dissection (provides introduction to sharps handling).	**Respiration** The biochemistry of respiration, effects of exercise, anaerobic respiration, metabolism, the role of the liver in oxygen debt. Balanced symbol equations, planning an experiment, analysis of data collected, cardiac output calculations.
	Cell Division The role of DNA, chromosomes, genes in a cell, how cells divide by mitosis, differentiation, cloning, stem cells. Microscope drawings, analysis and evaluation of advantages and disadvantages of contentious issues.	**Non-Communicable Disease** Lifestyle factors, causal mechanisms of disease, cancer, smoking and cardiovascular disease, lung disease and the effect on foetuses, diet, exercise, type 2 diabetes, alcohol and the effect on the liver, brain and foetuses, carcinogens, stents, artificial hearts, valves and pacemakers, statins. Analysis of relative sizes of different risks to health, analysis of large data sets (population level health risks and effects), interpreting data in terms of correlation versus causation, calculating BMI.	**Adaptations and Interdependence** The role of organisms in communities and ecosystems, abiotic and biotic factors, techniques to measure the distribution of living organisms, factors that plants and animals compete for, examples of the adaptations they have to enable this. Use of mean, mode, median, significant figures, evaluating fieldwork methods, calculating index of diversity.

		Analysis and application of knowledge to explain various treatments for cardiovascular disease, evaluation of their benefits and risks.	
	Enzymes and Digestion Tissues, organs, organ systems, digestive system, structure of biological molecules, role of enzymes in digestion and factors that affect them, bile and the liver. Practical complexity increasing to include multiple conditions and repeats.		
	Term 1	**Term 2**	**Term 3**
Y10	**Nervous System** Key elements of control systems, structure and function of nervous system, receptors, co-ordinators, effectors, reflexes, the brain, the eye and focusing, near and short sightedness. Modelling the synapse, evaluation of different methods of measuring reaction times, planning own experimental methods and evaluating reliability and accuracy.	**Reproduction and Inheritance** Sexual and asexual reproduction, meiosis and variation, DNA and the genome, gene expression and protein synthesis, mutations, rules of inheritance and Punnett squares, inheritance of gender, family trees, polydactyly, cystic fibrosis, screening for genetic disorders. Analysing texts about sexual and asexual variation, flower dissection (handling sharps), evaluation of benefits and risks of different methods of embryo screening, drawing Punnett squares.	**Genetics and Evolution** The work of Mendel, the theory of evolution by natural selection and the evidence for it, the ideas of Lamarck, Wallace and Darwin, speciation, the formation of and importance of fossils, causes of extinction, antibiotic resistance in bacteria as an example of evolution, classification systems and how they have changed over time. Evaluation of the strength of evidence to support various theories, analysis of various texts about Darwin, interpretation of complex graphs, considerations of different viewpoints through history.
	Communicable Disease Causes of ill health, types of pathogen, binary fission, aseptic technique, reducing the spread of disease, examples of disease	**Variation and Evolution** Environmental and genetic variation, natural selection, selective breeding, methods of cloning (cuttings, tissue cloning, embryo	**Photosynthesis** Describe photosynthesis in terms of reactants, products, limiting factors and conditions, adaptations of leaves, uses of

	including measles, HIV, salmonella, gonorrhoea, malaria, immunity and the role of white blood cells, vaccination, drug discovery and testing including penicillin, monoclonal antibodies. Aseptic technique, interpreting data on graphs about health, measuring growth of bacteria, analysing exponential graphs, critical review of the testing of new medicines.	cloning, adult cell cloning) and uses of cloning. Producing genetically modified organisms. Ethics of these technologies. Calculate bacterial population growth, evaluate advantages and disadvantages of various types of cloning.	glucose in plants, examples of plant disease including tobacco mosaic virus, rose black spot, mineral deficiencies, plant defence responses. Lines of best fit and gradients, writing risk assessments, balanced symbol equations.
	Term 1	**Term 2**	**Term 3**
Y11	**Hormones** What hormones are, role of pituitary gland, role of hormones in maintaining blood glucose concentration, diabetes, thyroxine, negative feedback, puberty, reproductive hormones and the menstrual cycle, contraception, treating infertility, plant hormones and responses, uses of plant hormones. The use of genetic engineering to make insulin. Investigation planning, interpreting complex graphs, evaluate different methods of contraception, consider different viewpoints on IVF, literacy skills – using key scientific vocabulary. Evaluating the use of genetic engineering to make insulin.	**Organising an Ecosystem** Feeding relationships and the importance of photosynthesis, predator-prey relationships, decay and the recycling of materials, particularly carbon and water, factors that affect the rate of decomposition, trophic levels and pyramids of biomass, biomass and energy transfers between trophic levels. Interpreting complex graphs, experiment planning, balanced symbol equations, percentage change and efficiency calculations.	**Revision and external exams**
	Homeostasis	**Humans and the Environment**	

	Regulation of body temperature, removal of waste products, role of kidneys in regulation of blood water and mineral ion content, kidney dialysis and transplants. The use of therapeutic cell cloning as a potential source of kidneys for transplant. Calculating percentage changes, evaluating models, evaluating different treatments for kidney failure, kidney dissection (sharps handling). Evaluating the use of therapeutic cell cloning.	Importance of biodiversity, how humans pollute the air, land and water, the causes and effects of deforestation, peat bog destruction and global warming, the impact of environmental changes of the distribution of organisms, actions humans can take to protect biodiversity, food security and factors that affect it, methods to increase the efficiency of food production including intensive versus extensive farming, sustainable fishing, mycoprotein. Data analysis, evaluation of issues surrounding climate change, evaluating the benefits and risks of different methods of food production and genetic technologies, graph gradient calculations, analysis of issues surrounding and evaluation of solutions to global food production.	