Science Overview - Biology

Year 9

	Term 1	Term 2	Term 3
Topic	**Cells and Cellular Processes** · The nucleus · Prokaryotic and Eukaryotic cells · Microscopy and Magnification · The movement of substances	**Biological systems for life** · Digestion · Enzymes · Dietary components	**Organisms and their interactions with the environment** · Variation and adaptations · Evolution and extinction
Learning Objectives	· Define the terms eukaryotic and prokaryotic. · State where DNA is found in a eukaryotic cell. · Define the terms chromosomes, genes, and DNA. · Describe the overall structure of DNA. · Explain the roles Watson, Crick, Franklin, and Wilkins had in the discovery of the structure of DNA. · State the functions of the sub-cellular structures commonly found in animal, plant, and bacterial cells. · Describe how to prepare a microscope slide and use a light microscope to examine a slide. · Evaluate light and electron microscopes. · Use the SI prefixes milli-, micro-, nano- and pico-. · Describe simply how substances move in to and out of cells.	· Describe the function of the different organs of the digestive system. · State the importance of bacteria in digestion. · Describe how enzymes are involved in the digestive system. · Describe the effect of temperature, pH, and substrate concentration on enzyme activity. · Explain how calorimetry is used to measure energy content of foods.	· Define the term species. · Describe and explain the types of variation shown by organisms. · Represent types of variation graphically. · Describe the process of natural selection. · Describe the evidence for evolution. · Explain how different factors affect population sizes. · State some methods used to try and prevent extinction.
Scaffolding SEND	glossaries, targeted questions, knowledge organisers, recall quizzes	glossaries, targeted questions, knowledge organisers, recall quizzes	glossaries, targeted questions, knowledge organisers, recall quizzes

Key Vocabulary	DNA, gene, inheritance, chromosome, X-ray crystallography, eukaryote, prokaryote, chromosomal DNA, plasmid DNA, organelle, flagella, acrosome, ciliated epithelial cells, coverslip, stage, objective lens, eye piece lens, magnification, resolution, electron, milli, micro, nano, pico	soluble, insoluble, ingestion, oesophagus, small intestine, pancreas, large intestine, rectum, anus, egestion, prebiotics, biological catalysts, substrates, polymers, synthesis, absorption, emulsion, lipids, lipases, fatty acids, glycerol, amylase, carbohydrase, amino acids, proteases, pepsin, monomers, villi, microvilli, chemical reagents, Benedict's, Biuret, Iodine, calorimetry	species, variation, adaptation, inherited, environmental, resources, classification, fertilisation, sexual reproduction, reproduction, offspring, probability, continuous, discontinuous, gametes, zygote, hybrids, histogram, normal distribution, scatter graph, correlation, mean, mode, median, endangered, extinction. environmental change, conservation, natural selection, survival of the fittest, evolution, gradual change, Darwin, Wallace, Lamarck, phylogenetic, competition, biodiversity, cloning, seed banks, pooters, pitfall traps, sweep nets
Formative Assessment	Rewind grids	Rewind grids	Rewind grids
Summative Assessment	End of unit test	End of unit test	End of unit test
Careers	botanist, immunologist, lab technician, marine biologist, neuroscientist, optician, urologist, zoologist	dietician, equine dentist, forensic scientist, marine biologist, urologist, x-ray technician, zoologist	botanist, conservationist, immunologist, marine biologist, urologist, zoologist
Links	To build on basic cell biology. To prepare for protein synthesis, diffusion, osmosis and active transport.	To build on the basic components of diets and the functioning of the parts of the digestive system. To prepare for factors affecting the action of enzymes.	To build on living things producing offspring of the same kind, but normally offspring vary and are not identical to their parents. To prepare for genetics and the theory of evolution.