

Curriculum Map 2021 onwards

Year view Subject: Biology				
Year 7	Knowledge/Content	Skills	Assessments/Checkpoints	Comments
Autumn Term 1	Cells Topic Introduction to biology & investigations Cells and cell structures Studying cells - microscopy Organisation	Investigation skills – guided writing of basic scientific method Practical skills - Use of light microscope	End of topic test - cells	Careers – working as a biologist
Autumn Term 2	Musculo-skeletal system Topic The human skeleton Joints and muscles Investigating forces at a joint Plant Reproduction Topic Flower structure Pollination – wind & insect	Investigation skills – collecting and recording data	End of topic test – Muscles & Movement	Careers – physiotherapy / occupational therapist / sport scientist
Spring Term 1	Plant Reproduction Topic (ctd) Importance of bees Seed dispersal and then Investigation- helicopters Germination and Germination investigation	Practical skills - Dissection skills Research skills – bees research Investigation skills – planning ‘salty seeds’ investigation, guided method writing Collecting & recording data, concluding.	End of topic test – Plant Reproduction Investigation plan write-up	Careers – plant biologist / entomology
Spring Term 2	Animal Reproduction Topic Ways of reproducing Male & female gametes Structure of male and female reproductive organs Menstrual cycle Intercourse and fertilisation	Research skills - Reading for information	End of topic test – Human Reproduction	Careers – medicine / midwifery / fertility clinics
Summer Term 1	Human Reproduction topic (ctd) Implantation & development of the foetus Effect of maternal lifestyle on foetal development	Presentation skills – information poster	End of topic test – Human Reproduction	
Summer Term 2	Variation Topic Causes & types of variation Environmental variation – nettles investigation DNA structure; Natural Selection	Investigation skills – measuring, presenting data	End of Year Exam	Careers – paleontology / geneticist

Curriculum Map 2021 onwards

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Year 8	Knowledge/Content	Skills	Assessments/Checkpoints	Comments
Autumn Term 1	Plants & Photosynthesis Topic Photosynthesis; Adaptations of leaves Uses of glucose; Limiting factors of photosynthesis Photosynthesis investigation	Practical skills – starch test on leaf Investigation skills – Collecting & recording results, presenting data & drawing conclusions, identifying limitations.	End of topic test – Plants & Photosynthesis	Links to Y7 cell structure Careers – plant biologist / agriculture
Autumn Term 2	Plants & Photosynthesis Topic (ctd) Osmosis & water movement Mineral nutrition Diet & Digestion Topic Components of balanced diet Food tests	Practical skills – carrying out food tests		
Spring Term 1	Diet & Digestion Topic continued Digestive system Enzymes Enzymes investigation Gut bacteria DCPIP practical	Investigation skills – enzymes investigation - identifying variables, collecting data & recording results, presenting results and drawing conclusions. Practical skills – carrying out DCPIP practical Maths skills - drawing calibration graph	End of topic test – Diet & Digestion test	Careers – biochemist / dietician
Spring Term 2	Respiration, Gas Exchange & Health topic Energy in food & energy requirements Respiration; Breathing Effects of smoking; Effects of recreational drugs	Practical skills – energy in food Maths skills – energy calculations	End of topic test – Respiration & Gas Exchange test	Careers – biochemist / sports science / pharmaceutical industry
Summer Term 1	Respiration, Gas Exchange & Health topic (ctd) Yeast anaerobic respiration investigation Interdependence Topic Food chains & webs; Bioaccumulation Pyramids of number & biomass	Investigation skills – anaerobic respiration investigation – identifying variables, collecting & recording results, drawing conclusions.	End of Year Exam	Careers – ecologist / environmental scientist
Summer Term 2	Interdependence Topic (ctd) Sampling techniques Adaptations & competition Biodiversity & the role of gene banks	Practical skills - Sampling techniques – frame quadrats Maths skills – population size calculations		

Curriculum Map 2021 onwards

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Year 9	Knowledge/Content	Skills	Assessments/Checkpoints	Comments *
Autumn Term 1	Cell structure & organisation Microscopy Cell transport	Practical skills - microscopy – preparing slides, magnification calculations Maths skills – measuring, magnification calculations, graph plotting	Cells minitest Cell transport test Required Practical – Microscopy Required Practical - Osmosis	Links to Y7 cell structure & Y8 digestion & respiration topics
Autumn Term 2	Enzymes & digestion Circulatory system Heart disease Gas exchange Health issues & lifestyle	Practical skills – writing a method – amending existing method, following instructions, dissection Research skills – heart disease/treatments	Required Practical - Enzymes Enzymes & digestion test Circulation & gas exchange test	Links to Y8 diet & digestion topic Y8 gas exchange & health topic
Spring Term 1	Aerobic & anaerobic respiration Exercise Metabolism	Practical skills – measuring heart rate	Respiration test	Links to Y8 respiration topic
Spring Term 2	Sampling Competition Biotic & abiotic factors Adaptations	Practical skills – sampling Maths skills – population calculations Research & presentation skills – adaptations project	Ecology test Required Practical - sampling	Links to Y8 interdependence topic
Summer Term 1	Food chains & pyramids Environmental change Human impact	Maths skills – Sankey diagrams, pyramids, efficiency calculations	Energy transfers & human impact test	Links to Y8 interdependence topic
Summer Term 2	Sustainable food production Decay & carbon cycle	Reading for information	Year 9 exam	

Curriculum Map 2021 onwards

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Year 10	Knowledge/Content	Skills	Assessments/Checkpoints	Comments *
Autumn Term 1	Decay & biogas Human impact review Plant organs Plant transport	Practical skills – identifying end points / colour standards, evaluating Maths skills – rate calculation 1000/t, graph drawing	Decay & human impact test Required Practical - Decay	
Autumn Term 2	Plant disease Plant mineral nutrition Photosynthesis Limiting factors Uses of glucose	Practical skills – setting up practical, recording & analysing data Math skills – $1/d^2$ light intensity	Plants & photosynthesis test Required practical - photosynthesis	Links to Y8 photosynthesis topic Opportunities to discuss working as a plant biologist
Spring Term 1	Plant responses DNA structure Protein synthesis Mutation	Practical skills – measuring Modelling – DNA structure	DNA & protein synthesis test Required practical – plant responses	
Spring Term 2	Mitosis & binary fission Asexual reproduction Sexual reproduction & meiosis Stem cells & growth	Maths skills – population growth calculations	Reproduction test	
Summer Term 1	Inheritance Genetic diagrams & Mendel Inherited disorders Variation Selective breeding	Maths skills – ratios and probabilities	Inheritance test Year 10 exam	Opportunities to discuss working as a geneticist e.g in NHS
Summer Term 2	Fossils & Extinction Natural selection & Evolution Speciation Classification Genetic Engineering	Application of knowledge – natural selection contexts	Evolution & Selection test	

Curriculum Map 2021 onwards

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Year 11	Knowledge/Content	Skills	Assessments/Checkpoints	Comments *
Autumn Term 1	Pathogens review Non-specific defence Specific defence - immunity Vaccinations Drug development Monoclonal antibodies Antibiotics Aseptic technique	Practical skills – microbiology – aseptic technique Maths skills – measuring zones of inhibition	Disease test Required practical - antibiotics	Opportunities to discuss working in microbiology / pharmacology / medicine Link antibiotic resistance to Y10 natural selection topic
Autumn Term 2	Stimuli & senses Nervous system & neurones Reflex arcs & synapses The Brain Eye structure & iris reflex Accommodation Correcting vision	Practical skills – collecting & analysing data	Nervous system test Required practical - responses	Opportunities to discuss working in ophthalmology, neuroscience
Spring Term 1	Negative feedback Control of body temperature Control of blood glucose Diabetes Kidneys & control of water Kidney failure	Visualisation of processes and sequences – flow charts etc	Mock exam Homeostasis test	Opportunities to discuss working in medicine
Spring Term 2	Menstrual cycle Control of fertility Adrenaline & thyroxine Revision / review Year 9, 10 and 11 topics Required Practicals	Maths skills in revision Summarising & revising Exam technique including longer questions	Past exam questions	
Summer Term 1	Revision / review	Revision skills Exam technique	GCSE Exams	
Summer Term 2	Bridging work for A Level			

Curriculum Map 2021 onwards

Year view Subject: Biology				
Year 12	Knowledge/Content	Skills	Assessments/Checkpoints	Comments *
Autumn Term 1	<p>Teacher 1 Biological molecules Carbohydrates Lipids Proteins Enzymes & enzyme activity</p> <p>Teacher 2 Cell structure intro Basic microscopy Magnification Eukaryotic cell structure & methods for studying Specialisation & organisation</p>	<p>Teacher 1 Practical skills – following instructions Maths skills - graph drawing, rates calculations including tangents Modelling using molymods</p> <p>Teacher 2 Practical skills – microscopy & slide preparation, eye piece, graticules & stage micrometers, centrifugation Maths skills – units and magnification calculations</p>	Three Week assessment test	Links to GCSE enzymes topic Career links - biochemistry
Autumn Term 2	<p>Teacher 1 Enzyme activity Digestion ATP & energy Biological importance of water Inorganic ions</p> <p>Teacher 2 Prokaryotic cell structure Virus structure Cell membrane structure Diffusion Diffusion practicals Osmosis & water potential Active transport Co-transport in gut & ORT</p>	<p>Teacher 1 Practical skills – following instructions, collecting & recording results, analysis of data Maths skills – rates calculations Research & referencing skills</p> <p>Teacher 2 Practical skills – use of colorimeter, recording results, graph skills, investigation planning, results table design</p>	<p>Teacher 1 Biological molecules test Required Practical – enzyme activity</p> <p>Teacher 2 Cell ultrastructure test Required Practical Membrane permeability Required Practical Water potential of plant tissue Cell transport test</p>	Links to GCSE cell transport Careers - virology

Curriculum Map 2021 onwards

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Spring Term 1	Teacher 1 DNA structure & function RNA structure & function DNA replication Cell cycle & mitosis Genes & the triplet code Teacher 2 Exchange & SA:Vol ratio Gas exchange – cells, insects Gas exchange - fish Gas exchange – human structure Breathing & exchange of gases in lungs Lung diseases	Teacher 1 Practical skills – microscopy, drawing Research & referencing skills Modelling – chromosomes -segregation Teacher 2 Practical skills – dissection Maths skills – ratios, stats test Spearman’s rank, lung disease data interpretation	DNA test Required practical – root tip squash Exchange test	Links to GCSE DNA topic Career links – genetics / cellular biology Links to GCSE exchange Careers – zoology / entomology
Spring Term 2	Teacher 1 Protein synthesis Mutation Variation Meiosis Natural selection Diversity Teacher 2 Haemoglobin & transport of oxygen Circulatory system of mammals Tissue fluid formation Heart structure & cardiac cycle	Teacher 1 Maths skills – standard deviation, error bars, hypothesis testing, t-test statistics, diversity index calculations Modelling – chromosomes -segregation / independent assortment. Founder effect - counters Teacher 2 Practical skills – dissection, drawing Research & referencing skills – risk assessment	Protein synthesis test Required Practical – dissection of mass transport organ eg heart	Links to GCSE variation & selection topic Links to GCSE heart & circulation Careers link - cardiology

Curriculum Map 2021 onwards

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Summer Term 1	Teacher 1 Species & taxonomy Non-specific defence mechanisms Humoral & cell mediated immunity Antibodies – structure & action Teacher 2 Cardiovascular disease Risk factors & data interpretation Plant transport Cohesion tension theory Transpiration - potometers Phloem structure Translocation – mass flow Evidence & interpretation	Practical skills – aseptic techniques Maths skills – calculations involving bacterial populations Teacher 2 Practical skills – slide preparation Maths skills – data analysis, potometer rate calculations	Variation, classification & selection test Required Practical - microbiology Year 12 exam Test – Circulatory system & cardiovascular disease Year 12 Exam	Links to GCSE disease topic Career links – microbiology / medicine
Summer Term 2	Teacher 1 Vaccination HIV – lifecycle Year 2 Topic Ecology Teacher 2 Year 2 Topic Introduction to photosynthesis, respiration & energy ATP Chloroplast structure Photosynthesis – light dependent reactions Chromatography Photosynthesis - light independent reactions	Practical skills – sampling techniques Maths skills – chi sq stats test Teacher 2 Practical skills – chromatography Research skills – Hill reaction Visualisation of processes and sequences – flow charts etc	Immunity test Required Practical – Ecology Required practical – Chromatography of photosynthetic pigments	Careers – virology Links to Year 1 cell ultrastructure topic Careers – plant biology

Curriculum Map 2021 onwards

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Year 13	Knowledge/Content	Skills	Assessments/Checkpoints	Comments *
Autumn Term 1	<p>Teacher 1 Bridging work review Ecology – review of field work RP 12 Distribution Populations – growth & cycles Mark-release-recapture Succession Succession examples Conservation Conservation IT research project Student presentations on conservation topics</p> <p>Teacher 2 Photosynthesis review Photosynthesis limiting factors Aerobic respiration Energy transfers and losses in food chains Productivity – net and gross Nutrient cycles – nitrogen & phosphorus</p>	<p>Teacher 1 Practical skills – planning investigation, sampling Maths skills – stats tests, logarithms, MRR calculations Research & reference skills Presentation skills Essay skills – intro, planning (group), writing</p> <p>Teacher 2 Practical skills – use of colorimeters Maths skills – percentage efficiency Research and reference skills</p>	<p>Test – Ecology Essay titles – abiotic factors, biological importance of water</p> <p>Required Practical – dehydrogenase activity in chloroplasts Test – Photosynthesis Required Practical – Respiration in yeast Test – Respiration Test – Energy transfers & nutrient cycles</p>	<p>Links to GCSE human impact topic, respiration, photosynthesis Careers link – ecologist, population biologist</p>
Autumn Term 2	<p>Teacher 1 Monohybrid inheritance Co-dominance; Sex linkage; Dihybrid inheritance Chi sq goodness of fit Linkage & epistasis; Hardy-Weinberg; Variation Natural selection types; Speciation; Genetic drift</p> <p>Teacher 2 Survival & response Receptors & effectors – reflex arcs Plant responses - IAA Receptors – Pacinian corpuscles, rods & cones Control of heart rate</p>	<p>Teacher 1 Maths skills – ratios and probabilities, H-W calculations Essay skills – planning & writing</p> <p>Teacher 2 Practical skills – investigation planning, collecting & analysing results Maths skills – stats tests</p>	<p>Test – Inheritance Essay titles – inorganic ions, importance of variation</p> <p>Required Practical 10 – choice chambers</p>	<p>Links to GCSE genetics topic & Year 1 DNA topic, GCSE nervous system/reflex arcs Careers link - geneticist</p>

Curriculum Map 2021 onwards

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Spring Term 1	<p>Teacher 1 Mutations Cell division & cancer Tumour suppressor genes & oncogenes Risk factors for cancer – data interpretation Cancer treatment Stem cells & uses Controlling transcription – transcription factors & RNAi Gene expression Epigenetics</p> <p>Teacher 2 Neurones – resting & action potentials Synapses & summation Drugs at synapses Muscle structure & contraction Neuromuscular junctions</p>	<p>Teacher 1 Essay skills – planning & writing Maths skills – data interpretation</p> <p>Teacher 2 Practical skills – investigation planning, collecting & analysing results Maths skills – stats tests</p>	<p>Year 13 mock exams Test – Gene expression Essay titles – responding to change, carbon dioxide</p> <p>Test – Nervous system</p>	<p>Links to Year 1 protein synthesis topic Careers link – cell biologist, cancer research, biochemist</p> <p>Links to Year 1 cell transport topic</p>
Spring Term 2	<p>Teacher 1 Genome projects Recombinant DNA technology Gene cloning – in vivo / vitro Gene therapy Gene probes & medical diagnosis Genetic fingerprinting</p> <p>Teacher 2 Homeostasis – negative & positive feedback Control of blood glucose & diabetes Kidneys – structure & function Control of water potential in blood</p>	<p>Teacher 1 Essay skills – planning & writing</p> <p>Teacher 2 Essay skills Practical skills – use of colorimeter Maths skills – calibration graphs Visualisation of processes and sequences – flow charts etc</p>	<p>Choice of essay titles</p> <p>Required Practical 11 Concentration of glucose</p>	<p>Links to GCSE genetic engineering topic Career link – geneticist, genetic counsellor in NHS, biochemistry, genetic engineering</p> <p>Links to Year 1 cell transport topic</p>
Summer Term 1	<p>Teacher 1 and 2 Review & revision</p>	<p>Essay skills Exam technique</p>	<p>A Level Exams</p>	