



Year **10** Science Curriculum: Biology

	Autumn	Spring	Summer
Topic	<p>Organisation (GCSE Concepts) Infection & Response GCSE Concepts</p>	<p>Organisation of Animals and Plants (GCSE concepts) Bioenergetics & Respiration</p>	<p>Ecology Bioenergetics Photosynthesis</p>
Knowledge Covered	<p>Cell Biology (GCSE concepts) Eukaryotes and prokaryotes Cell differentiation Microscopy Mitosis and the cell cycle Stem cells Diffusion Osmosis Active transport</p>	<p>Organisation of animals and plants (GCSE concepts) Principles of organisation Animal tissues, organs, organ systems, Cell specialisation Plant tissues, organs and systems</p>	<p>Ecology Communities Abiotic factors and biotic factors Adaptations Organisation of an ecosystem How materials are cycles Biodiversity Waste management Land use, deforestation, global warming Maintaining biodiversity</p>
	<p>Infection and Response (GCSE Concepts) Students will be learning: Vaccination Antibiotics and painkillers Discovery and development of drugs</p>	<p>Bioenergetics; Respiration Students will be learning: Aerobic respiration Anaerobic respiration Effects of exercise on respiration Anaerobic respiration in yeast and bacteria</p>	<p>Bioenergetics; Photosynthesis Students will be learning: Photosynthesis Factors affecting the rate of photosynthesis Uses of glucose Mineral ions needed by plants</p>
Online Resources	<ul style="list-style-type: none"> Interactive cells and games, workshops and visits also included: https://www.centreforthecell.org/ Resources and workshops: medicalmavericks.co.uk/for-teachers medicalmavericks.co.uk/posters/secondary-posters Diffusion sim: phet.colorado.edu/sims/html/diffusion/latest/diffusion_en.html 	<ul style="list-style-type: none"> Aerobic respiration revision video: youtube.com/watch?v=HZtXLhm7ISA Free science lessons: Bioenergetics playlist - youtube.com/playlist?list=PL9IouNCPbCxXVpEqkFRN5Jq8ZZTBRRWUz NATIONAL SCIENCE WEEK 	<ul style="list-style-type: none"> Predator prey interactive sim: phschool.com/atschool/phbio/active_art/predator_pre_simulation/index.html Ecology concept sims: uen.org/core/science/studentactivities/biology.shtml



Year **10** Science Curriculum: Chemistry

	Autumn	Spring	Summer
Topic	Chemical Changes (GCSE Concepts) Electrolysis Quantitative Analysis	Energy Changes The Rate and Extent of Chemical Change	Chemical Analysis
Knowledge Covered	Chemical Changes (GCSE concepts) Redox reactions (Higher tier only) Neutralisation of acids and salt production Soluble salts The pH scale and neutralisation Strong and weak acids (Higher tier only)	Energy Changes Energy transfer during exothermic and endothermic reactions Reaction profiles The energy change of reactions (Higher tier only)	Chemical Analysis Pure substances Formulations Identification of common gases: hydrogen, oxygen, carbon dioxide, chlorine
	Electrolysis Electrolysis Electrolysis of molten ionic compounds Using electrolysis to extract metals Electrolysis of aqueous solutions Half equations at the electrodes (Higher tier only)	The Rate and Extent of Chemical Change Calculating rates of reactions Factors which affect the rates of chemical reactions Collision theory and activation energy Catalysts Reversible reactions	
	Quantitative Analysis Conversion of mass and balanced chemical equation Relative formula mass Mass changes when a reactant or product is a gas Chemical measurements	Energy changes and reversible reactions Equilibrium The effects of changing concentration, pressure, and temperature on equilibrium (Higher tier only)	
Online Resources	Electrolysis, Quantitative Analysis: Interactive electrolysis with predictions media.pearsoncmg.com/bc/bc_0media_chem/chem_sim/html5/Electro/Electro.php media.pearsoncmg.com/bc/bc_0media_chem/chem_sim/html5/Electro/Electro.php Balancing equations: phet.colorado.edu/en/simulation/balancing-chemical-equations Free Science Lessons Quantitative chemistry playlist: youtube.com/playlist?list=PL9louNCPbCxUhxR4SNfwmaRB8mYX3	Energy Changes, Rate and Equilibrium Simulations for rates of reaction: web.archive.org/web/20160305171658/http://freezeray.com/chemistry.htm Free Science Lessons Energy Changes playlist: youtube.com/playlist?list=PL9louNCPbCxX74bPz0TGVVmyGYgMarWu NATIONAL SCIENCE WEEK	Organic Chemistry Balancing equations: https://phet.colorado.edu/en/simulation/balancing-chemical-equations Combustion and moles: media.pearsoncmg.com/bc/bc_0media_chem/chem_sim/html5/stoich/Stoich.php



Year **10** Science Curriculum: Physics

	Autumn	Spring	Summer
Topic	Energy (GCSE Concepts) Electricity	Atomic Structure (GCSE Concepts) Particle Model	Forces
Knowledge Covered	Energy (GCSE Concepts) Students will be learning: <ul style="list-style-type: none"> Energy transfers in a system 	Atomic Structure (GCSE Concepts) Atoms and isotopes Atoms and nuclear radiation	Forces Scalar and vector quantities Contact and non-contact forces Weight and gravitational fields Resultant force Free body diagrams
	Electricity Current, potential difference and resistance Series and parallel circuits Domestic uses and safety Energy transfers	Particle Model Change of state and the particle model Internal energy transfers Particle model and pressure	
Online Resources	<ul style="list-style-type: none"> IOP electricity resources: spark.iop.org/domains/electricity-and-magnetism Electricity misconceptions from IOP: spark.iop.org/misconceptions?f%5B0%5D=search_misconceptions_domain%3A446 Free Science lessons playlist for electricity: youtube.com/playlist?list=PL9louNC-PbCxXc2NQoIZN7-3jIKN7vW-Sq 	<ul style="list-style-type: none"> Atomic Structure: Alpha decay sim phet.colorado.edu/en/simulation/legacy/alpha-decay Beta decay sim: phet.colorado.edu/en/simulation/legacy/beta-decay NATIONAL SCIENCE WEEK 	<ul style="list-style-type: none"> Forces: Stopping Distances RAC rac.co.uk/drive/advice/learning-to-drive/stopping-distances/ Moments: phet.colorado.edu/sims/html/forces-and-motion-basics/latest/forces-and-motion-basics_en.html Forces and motion: phet.colorado.edu/sims/html/forces-and-motion-basics/latest/forces-and-motion-basics_en.html Momentum: phet.colorado.edu/en/simulation/legacy/collision-lab



Year 11 Science Curriculum: Biology

	Autumn	Spring	Summer
Topic	Control – Homeostasis & Response Inheritance, Variation, Evolution	Inheritance & Ecology	
Knowledge Covered	Control- Homeostasis and response Homeostasis The human nervous system Hormonal coordination in humans The use of hormones to treat infertility (Higher tier only) Feedback systems (Higher tier only)	Inheritance, Variation, Evolution Reproduction hormonal coordination in humans Variation and evolution The development of understanding of genetics and evolution	External Examinations
	Inheritance, Variation, Evolution Reproduction hormonal coordination in humans Variation and evolution The development of understanding of genetics and evolution	Ecology Communities Abiotic factors and biotic factors Adaptations Organisation of an ecosystem How materials are cycles Biodiversity Waste management Land use, deforestation, global warming Maintaining biodiversity	
Online Resources	<ul style="list-style-type: none"> • Homeostasis and response: Endocrine system game/sim: biomanbio.com/HTML5GamesandLabs/Physiogames/endocrine_edhtml5page.html • Inheritance, variation and evolution: Interactive models to show case variation and evolution: bioogysimulations.com/simulations • Free Science lesson inheritance playlist: youtube.com/playlist?list=PL9louNCPbCxWt28Bifo2jK9xn-ym956sf • Predator prey interactive sim: phschool.com/atschool/phbio/active_art/predator_pre_simulation/index.html • Ecology concept sims: uen.org/core/science/studentactivities/biology.shtml 		



Year 11 Science curriculum: Chemistry

	Autumn	Spring	Summer
Topic	Earth's Atmosphere & Resources and Organic Chemistry	Chemical Analysis & Using resources	
Knowledge Covered	Chemistry of the Atmosphere Students will be learning: The composition and evolution of the Earth's atmosphere Carbon dioxide and methane as greenhouse gases Human activities and the impact of global climate change Common atmospheric pollutants and their sources	Chemical analysis Pure substances Formulations Chromatography Identifying common gases such as hydrogen, oxygen, carbon dioxide and chlorine	External Examinations
	Organic Chemistry Crude Oil, hydrocarbons and alkanes Fractional distillation and petrochemicals Properties of hydrocarbons Cracking and Alkenes	Using resources Sustainable development Potable water Waste water treatment Reducing waste materials	
Online Resources	<ul style="list-style-type: none"> • Earth's atmosphere and resources: LCA and other topics revision notes: savemyexams.co.uk/gcse-chemistry-aqa-new/revision-notes/using-resources/life-cycle-analysis-recycling/life-cycle-assessment/ • National geographic clip on water treatment: youtube.com/watch?v=YW6GBciRHLg • Visit opportunity: visit a local water treatment plant. • Chemistry: Free Science lessons playlist: youtube.com/watch?v=3oJxWwcnfJY&list=PL9louNCPbCxXIBeaxeOG5yf_pGrxzOyR • Videos of gas tests youtube.com/watch?v=P_gPIbExHv0 		



Year 11 Science curriculum: Physics

	Autumn	Spring	Summer
Topic	Energy & Electricity	Waves and Electromagnetism	
Knowledge Covered	Energy (GCSE Concepts) Energy stores and systems Energy transfers in a system Energy conservation & dissipation Efficiency & Power	Waves Waves in air, fluids, and solids Transverse and longitudinal waves Properties of waves Types, properties, and uses of electromagnetic waves	External Examinations
	Electricity Current, potential difference and resistance Series and parallel circuits Domestic uses and safety	Electromagnetism Permanent and induced magnetism, magnetic forces and fields The motor effect Electromagnetism Fleming's left-hand rule (Higher tier only) Electric motors (Higher tier only)	
Online Resources	<ul style="list-style-type: none"> • Waves Interactive: Waves on a string: phet.colorado.edu/sims/html/wave-on-a-string/latest/wave-on-a-string_en.html • Interactive ripple tank + sound and light waves: phet.colorado.edu/sims/html/wave-interference/latest/wave-interference_en.html • What is a wave? Basics: pbslearningmedia.org/resource/lsp07.sci.phys.energy.waves/what-is-a-wave/ • Magnetism and electromagnetism - Induction simulation: phet.colorado.edu/sims/html/faradays-law/latest/faradays-law_en.html • Electric bell diagram: web.archive.org/web/20160306083431/http://freezeray.com/flashFiles/electricBell.htm • IOP electricity & magnetism resources: spark.iop.org/domains/electricity-and-magnetism • Electricity & magnetism misconceptions from IOP: spark.iop.org/misconceptions?f%5B0%5D=search_misconceptions_domain%3A446 		