

Science Curriculum – KS3 Overview

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y7 Chemistry	<ul style="list-style-type: none"> • The structure of the Earth • Types of rock and the rock cycle • Climate change, the greenhouse effect and recycling • Science practical skills • Lab safety • Drawing tables and graphs 		<ul style="list-style-type: none"> • How particles behave in solids, liquids and gases • Changes of state (e.g. freezing, melting, boiling, evaporation and condensation) • Dissolving • Diffusion • Science practical skills 		<ul style="list-style-type: none"> • Acids and alkalis • Neutralisation • The pH scale • Science practical skills 	
Y7 Biology	<ul style="list-style-type: none"> • MRS GREN (life processes) • Animal and plant cells and organ systems • Using microscopes • Science practical skills • Lab safety • Drawing tables and graphs 		<ul style="list-style-type: none"> • Puberty • Reproduction in animals and plants • Pregnancy and birth • Genetic inheritance • Science practical skills 		<ul style="list-style-type: none"> • Breathing and respiration • The effects of smoking • The heart, blood and blood vessels • The skeleton and muscles • Science practical skills 	
Y7 Physics	<ul style="list-style-type: none"> • Energy (what and where is energy?) • Energy resources and renewable energy resources • Science practical skills • Lab safety • Drawing tables and graphs 		<ul style="list-style-type: none"> • Types of force • Balanced and unbalanced forces • Science practical skills 		<ul style="list-style-type: none"> • How the movement of the Earth influences day/night and the seasons • The moon and other satellites • Planets within our solar system • Science practical skills 	

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y8 Biology	<u>Photosynthesis</u> <ul style="list-style-type: none"> • What is needed for photosynthesis? • Structure of the leaf and transpiration. • What factors affect photosynthesis? 	<u>Photosynthesis</u> <ul style="list-style-type: none"> • What is needed for photosynthesis? • Structure of the leaf and transpiration. • What factors affect photosynthesis? 	<u>Nutrition and Digestion</u> <ul style="list-style-type: none"> • Balanced diet • Organs of Digestion • Enzymes 	<u>Nutrition and Digestion</u> <ul style="list-style-type: none"> • Balanced diet • Organs of Digestion • Enzymes 	<u>Ecology</u> <ul style="list-style-type: none"> • Food chains and webs • Rock pool Fieldwork • Adaptation and extinction 	<u>Ecology</u> <ul style="list-style-type: none"> • Food chains and webs • Rock pool Fieldwork • Adaptation and extinction
Y8 Physics	Forces and motion <ul style="list-style-type: none"> • How can I calculate speed? • Interpreting distance time graphs • What happens when you skydive? 		Light and sound <ul style="list-style-type: none"> • What happens to light during reflection and refraction? • What is visible light? • Why can I see colours? • What is sound 		Electricity and magnetism <ul style="list-style-type: none"> • Static • Building series and parallel circuits • Measuring current and voltage • Magnetism and compasses • Building electromagnets 	
Y8 Chemistry	Elements and Compounds <ul style="list-style-type: none"> • What are elements, compounds and mixtures? • How can we separate different mixtures? • Atomic structure and the periodic table • Development of scientific models 		What is a chemical change? <ul style="list-style-type: none"> • What is the difference between physical and chemical change? • How can we test for different gases? • What are exothermic and endothermic reactions? • Do different metals have different reactivity? 		How can I make a reaction go faster? <ul style="list-style-type: none"> • What factors affect the rate of reaction? • How can I measure the rate of reaction? 	

Science - Biology Curriculum – KS4 Overview

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y9 Biology	<p><u>What are we made of?</u></p> <ul style="list-style-type: none"> -The structure of cells -Specialised cells -Microscopy 	<p><u>How do cells grow?</u></p> <ul style="list-style-type: none"> - Mitosis (Cell division) -Stem cells 	<p><u>How do cells get the materials they need?</u></p> <ul style="list-style-type: none"> -Diffusion -Osmosis -Active transport 	<p><u>What is Digestion?</u></p> <ul style="list-style-type: none"> -Digestive system -Enzymes -Testing for carbohydrates, proteins and lipids 	<p><u>What is Digestion?</u></p> <ul style="list-style-type: none"> -Digestive system -Enzymes -Testing for carbohydrates, proteins and lipids 	<p><u>How do we get the digested food to our cells?</u></p> <ul style="list-style-type: none"> -The heart -The blood -Blood vessels
Y10 Trilogy Biology	<p><u>What is a non-communicable disease?</u></p> <ul style="list-style-type: none"> -Coronary heart disease -Cancer <p>How do plants get the materials they need?</p> <ul style="list-style-type: none"> -Leaf structure - Transpiration (the flow of water through the plant) 	<p><u>What is a communicable disease?</u></p> <ul style="list-style-type: none"> -Pathogens -Body defence systems -Vaccinations 	<p><u>How do organisms get the energy they need?</u></p> <ul style="list-style-type: none"> -Photosynthesis -Respiration -Metabolism 	<p><u>How do organisms respond to stimuli?</u></p> <ul style="list-style-type: none"> -The nervous system -Hormones and the control of glucose 	<p><u>How do organisms respond to stimuli?</u></p> <ul style="list-style-type: none"> -Fertility Hormones -Contraception <p>How do organisms interact?</p> <ul style="list-style-type: none"> -Abiotic and biotic factors - Adaptations 	<p><u>How do organisms interact?</u></p> <ul style="list-style-type: none"> -Feeding relationships -Carbon cycle -Biodiversity -Biology fieldwork -Human impact on the environment

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y10 Biology	<p><u>What is a non-communicable disease?</u> -Coronary heart disease -Cancer</p> <p><u>How do plants get the materials they need?</u> -Leaf structure - Transpiration (the flow of water through the plant)</p>	<p><u>What is a communicable disease?</u> -Pathogens -Body defence systems -Vaccinations -monoclonal antibodies -Plant disease</p>	<p><u>How do organisms get the energy they need?</u> -Photosynthesis -Respiration -Metabolism</p>	<p><u>How do organisms respond to stimuli?</u> -The nervous system - The brain -The eye -The kidney</p>	<p><u>How do organisms respond to stimuli?</u> -Hormones and the control of glucose -Fertility hormones -Contraception -Plant hormones</p>	<p><u>How do organisms interact?</u> -Abiotic and biotic factors - Adaptations -Feeding relationships -Biology fieldwork</p>
Y11 Trilogy Biology	<p><u>Why do I look like I do?</u> -Reproduction -DNA -Inherited disorders - Selective breeding -Genetic engineering</p>	<p><u>Why have organisms changed over time?</u> -Evolution -Fossils -Extinction</p>	<p><u>What are the key idea's I need to know in Biology?</u> -Biological molecules -Cells -Organ systems</p>	<p><u>What are the key idea's I need to know in Biology?</u> -Photosynthesis -Respiration -Populations -Cycles -Biodiversity -Characteristics -Evolution</p>	Exams	Exams
Y11 Biology	<p><u>How do organisms interact?</u> -Human impact on the environment - Food production</p>	<p><u>Why do I look like I do?</u> -Reproduction -DNA -Inherited disorders - Selective breeding -Genetic engineering -Cloning</p>	<p><u>Why have organisms changed over time?</u> -Evolution -Fossils -Extinction -Speciation</p>	<p><u>Biology only parts of specification</u> -Monoclonal antibodies -Plant defence -The Brain -The Eye -The Kidney -Hormones</p>	Exams	Exams

Science - Biology Curriculum – KS5 Overview

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y12	<p>Teacher A <u>Biological molecules</u> -Carbohydrates -Lipids -Proteins</p> <p>Teacher B <u>Cells</u> -Cell Structure -Cell Division</p>	<p>Teacher A <u>Biological molecules</u> -Proteins -Nucleic acid -ATP</p> <p>Teacher B <u>Cells</u> -Transport in cells -Cells and the - immune system</p>	<p>Teacher A <u>Organisms exchange substances with their surroundings</u> -Gas exchange -Digestion</p> <p>Teacher B <u>Genetics</u> -DNA</p>	<p>Teacher A <u>Organisms exchange substances with their surroundings</u> -Mass Transport</p> <p>Teacher B <u>Genetics</u> -Protein synthesis -Genetic diversity</p>	<p>Teacher A <u>Organisms exchange substances with their surroundings</u> -Mass Transport</p> <p>Teacher B <u>Genetics</u> -Genetic diversity -Biodiversity</p>	<p>Teacher A <u>Ecology</u> -Populations</p> <p>Teacher B <u>Energy transfers</u> -Photosynthesis -Respiration</p>
Y13	<p>Teacher A <u>Nervous system</u> -Receptors -Nerve impulses</p> <p>Teacher B <u>Energy transfers</u> -Photosynthesis -Respiration</p>	<p>Teacher A <u>Nervous system</u> -Nerve impulses -Synapses -Muscles</p> <p>Teacher B <u>Energy transfers</u> -Energy and ecosystems -Nutrient cycles</p>	<p>Teacher A <u>Homeostasis</u> -Control of blood sugar -Control of water</p> <p>Teacher B <u>Gene Expression</u> -Transcription and Translation -Genome project</p>	<p>Teacher A & B <u>Genetics, Populations, Evolution and Ecosystems</u> -Inheritance -Populations -Evolution</p>	Exams	Exams

Science - Chemistry Curriculum – KS4 Overview

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
9 2021/22	Understanding the basics of Chemistry:	Understanding more about the Atom:	Chemical Bonding and the properties of matter.	Understanding Metals and their properties.	What are the types of chemical changes that occur and why	The key reactions of metals and acids.
10 2021/22	Extending our understanding of Chemical changes.	The calculations we need for chemistry.	Understanding energy changes in chemical reactions.	What factors affect the rate of a reaction?	How we make use of crude oil?	How can we test for common gases?
Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
11 2021/22	How do we use the Earth's resources? Do we do it sustainably?	Trilogy: Required practical's for Paper 1 Separates: The calculations we need for Chemistry.	Trilogy: Required practical's for Paper 2 Separates: How do we use the Earth's resources? Do we do it sustainably? How can we test for common ions?	Trilogy: revision Separates: How we make use of crude oil.	Summer examinations	Summer examinations

Science - Chemistry Curriculum – KS5 Overview

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
12 – Teacher A	Understanding the structure of the atom links to the Periodic Table.	How can we determine the amount of a substance?	Determining energy changes in chemical reactions	The reactions of Group 2 and Group 7	The principles of Thermodynamics	Reactions of acids and bases
12 -Teacher B	Understanding Chemical bonding	Introduction to Organic Chemistry	The reactions of the Alkanes and Halogen alkanes	The reactions of the Alkenes and Alcohols	Organic Analysis techniques	Understanding Aromatic Chemistry
Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
13- Teacher A	Reactions of Acids and bases (A-level only)	Acid and Bases part 2 Reactions of Period 3 elements Understanding the Transition metals	Transition Metals	Electrode Potentials and Electrochemical Cells (A Level Only)	Reactions of ions in aqueous solutions (A Level only)	Summer exams
13 –Teacher B	Optical isomerism Aldehydes and ketones Carboxylic acids and derivatives Amines	Polymers Amino acids, proteins and DNA NMR spectroscopy	Chromatography Organic synthesis	Rate equations Equilibrium Constants Kp for homogeneous systems		Summer exams

Science - Physics Curriculum – KS 4 Overview

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y9	Topic: Energy -Energy transfers & efficiency -Work and power -Reducing energy losses	Topic: Energy -National and global energy resources	Topic: Forces -Contact and non-contact forces -Force diagrams -Resultant forces -Speed and velocity -Distance-time graphs	Topic: Forces -Acceleration -Velocity-time graphs -Stopping distances	Topic: Electricity -Introduction to mains electricity -Safety -3-pin plugs, fuses and earth wire -Power, energy transfers and the National Grid	Topic: Electricity and circuits -Circuit components and diagrams -Series and parallel circuits Current and Potential difference
Y10	Topic: Particle model of matter -Density -Changes in temperature related to kinetic energy of particles -Changes in state -Gas pressure	Topic: Atomic structure and radiation -Theory of atomic structure -Radioactive nuclei -Types of radiation -Uses and dangers of radiation	Topic: Electricity and circuits -Circuit components -Circuit diagrams -Current, potential difference and resistance	Topic: Electricity and circuits -Series and parallel circuits -Mains electricity and the National Grid	Topic: Energy -Energy stores and transfers and efficiency -Kinetic, gravitational and elastic potential energy	Topic: Forces -Scalars and vectors -Contact and non-contact forces -Newton's Laws
Y11 Trilogy	Topic: Forces -Elasticity -Distance and displacement -Speed and velocity -Time graph relationships -Acceleration -Stopping distances -Momentum	Topic: Waves -Wave properties -Wave speed -Electromagnetic waves	Topic: Electromagnetism -Magnetic fields -Electromagnetism -Motor effect	Revision: Key ideas -Energy -Electricity -Matter -Atomic structure and radiation	Revision: Key ideas -Forces -Waves -Electromagnetism Exam period	Exam period
Y11 Separate Physics	Topic: Forces -Elasticity -Moments, levers and gears -Pressure -Momentum and changes in momentum	Topic: Forces -Distance and displacement -Speed and velocity -Time graph relationships -Acceleration -Stopping distances	Topic: Waves -Wave properties -Wave speed -Reflection and refraction -Sound -Detection and exploration -Electromagnetic waves -Black body radiation	Topic: Electromagnetism -Magnetic fields -Electromagnetism -Induced potential -Generator effect -Transformers	Topic: Space -Solar system -Star lifecycles -Orbital motion -Red shift Exam period	Exam period

Science Curriculum - Physics Curriculum – KS5 Overview

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y12	<p>(Teacher A) Mechanics -Vectors -Moments -SUVAT and projectiles</p> <p>(Teacher B) Particles and Radiation -Matter and Radiation -Quarks and Leptons</p>	<p>(Teacher A) Mechanics -Forces -Momentum -Work and conservation of energy</p> <p>(Teacher B) Particles and Radiation -Quantum phenomena -Photoelectric effect -Energy levels and spectra</p>	<p>(Teacher A) Electricity -Basics of electricity -Current-voltage characteristics -Resistivity</p> <p>(Teacher B) Waves and Optics -Wave properties -Stationary and progressive waves</p>	<p>(Teacher A) Electricity -Potential divider -EMF and internal resistance</p> <p>(Teacher B) Waves and Optics -Refraction -Total Internal Reflection -Interference</p>	<p>(Teacher A) Materials -Bulk properties of solids -Young modulus</p> <p>(Teacher B) Waves and Optics -Diffraction -Diffraction grating</p>	<p>(Teacher A) Further mechanics -Rotational motion</p> <p>(Teacher B) Radioactivity -Properties -Decay and decay modes</p>
Y13	<p>(Teacher A) Further mechanics -Rotational motion review -Simple harmonic motion and resonance</p> <p>(Teacher B) Fields -Gravitational Field -Electric Field</p>	<p>(Teacher A) Further mechanics -Thermal Physics -Gas laws</p> <p>(Teacher B) Fields -Capacitors -Magnetic Field</p>	<p>(Teacher A) Engineering Physics -Moment of inertia and kinetic energy -Acceleration -Torque -Flywheels</p> <p>(Teacher B) Fields - Electromagnetic Induction</p>	<p>(Teacher A) Engineering Physics -Thermodynamics -PV diagrams -Engines -Heat engines -Reversed heat engines</p> <p>(Teacher B) Nuclear Energy -Energy & mass -Binding energy -Fission & Fusion</p>	<p>Revision</p> <p>Exam period</p>	Exam period