Science Curriculum – KS3 Overview

Year	Autumn 1 Autumn 2	Spring 1 Spring 2	Summer 1 Summer 2
Y7 Chemistry	• 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	• How particles behave in solids, liquids and gases • Changes of state (e.g. freezing, melting, boiling, evaporation and condensation) • Dissolving • Diffusion • Science practical skills	• Acids and alkalis • Neutralisation • The pH scale • Science practical skills
Y7 **Biology**	• MRS GREN (life processes) • Animal and plant cells and organ systems • Using microscopes • Science practical skills • Lab safety • Drawing tables and graphs	• Puberty • Reproduction in animals and plants • Pregnancy and birth • Genetic inheritance • Science practical skills	• Breathing and respiration • The effects of smoking • The heart, blood and blood vessels • The skeleton and muscles • Science practical skills
Y7 **Physics**	• Energy (what and where is energy?) • Energy resources and renewable energy resources • Science practical skills • Lab safety • Drawing tables and graphs	• Types of force • Balanced and unbalanced forces • Science practical skills	• 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 Physics	Forces and motion • Forces and moments • Pressure • How can I calculate speed? • Interpreting distance time graphs • What happens when you skydive?	Light and sound • What happens to light during reflection and refraction? • What is visible light? • Why can I see colours? • What is sound •	Electricity and magnetism • Static • Building series and parallel circuits • Measuring current and voltage • Magnetism and compasses • Building electromagnets
Y8 Chemistry	Elements and Compounds • What are elements, compounds and mixtures? • How can we separate different mixtures? • Atomic structure and the periodic table • Development of scientific models	**The Periodic Table** • How did the Periodic Table develop over time • The groups of the Periodic table • Metal and non-metals. • Properties of the elements • Metals and Metal Oxides	**What is a chemical change?** • 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? •
Y8 **Biology**	Photosynthesis • What is needed for photosynthesis? • Structure of the leaf and transpiration. • What factors affect photosynthesis?	Nutrition and Digestion • Balanced diet • Organs of Digestion • Enzymes	Ecology • Food chains and webs • Rock pool Fieldwork • Adaptation and extinction

Science - Biology Curriculum – KS3-KS4 Overview

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y9	***What are we made of?*** -The structure of cells -Specialised cells -Microscopy	**How do cells grow?** - Mitosis (Cell division) -Stem cells	**How do cells get the materials they need?** -Diffusion -Osmosis -Active transport	**What is Digestion?** -Digestive system -Enzymes -Testing for carbohydrates, proteins and lipids	**What is Digestion?** -Digestive system -Enzymes -Testing for carbohydrates, proteins and lipids	**How do we get the digested food to our cells?** -The heart -The blood -Blood vessels

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y10 Trilogy Biology	**What is a non communicable disease?** -Coronary heart disease -Cancer **How do plants get the materials they need?** -Leaf structure - Transpiration (the flow of water through the plant)	**What is a communicable disease?** -Pathogens -Body defence systems -Vaccinations	**How do organisms get the energy they need?** -Photosynthesis	**How do organisms get the energy they need?** -Respiration -Metabolism **How do organisms respond to stimuli?** -The nervous system	**How do organisms respond to stimuli?** -Hormones and the control of glucose **How do organisms respond to stimuli?** -Fertility Hormones -Contraception	**How do organisms interact?** -Abiotic and biotic factors - Adaptations -Feeding relationships -Carbon cycle -Biodiversity
Y10 Separate Biology	**What is a non-communicable disease?** -Coronary heart disease -Cancer **How do plants get the materials they need?** -Leaf structure - Transpiration (the flow of water through the plant)	**What is a communicable disease?** -Pathogens -Body defence systems -Vaccinations -monoclonal antibodies -Plant disease	**How do organisms get the energy they need?** -Photosynthesis -Respiration -Metabolism	**How do organisms respond to stimuli?** -The nervous system -Temperature control - The brain -The eye	**How do organisms respond to stimuli?** -The kidney -Hormones and the control of glucose	**How do organisms respond to stimuli?** -Fertility hormones -Contraception -Plant hormones

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y11 Trilogy Biology	**How do organisms interact?** -Feeding relationships -Carbon cycle -Biodiversity -Biology fieldwork -Human impact on the environment	**Why do I look like I do?** -Reproduction -DNA -Inherited disorders - Selective breeding -Genetic engineering	**Why have organisms changed over time?** -Evolution -Fossils -Extinction	**What are the key idea's I need to know in Biology?** - Biological molecules -Cells -Organ systems Photosynthesis -Respiration -Populations -Cycles -Biodiversity -Characteristics -Evolution	Revision and Exams	Exams
Y11 Separate Biology	**How do organisms interact?** -Abiotic and biotic factors - Adaptations -Feeding relationships -Biology fieldwork	**How do organisms interact?** -Human impact on the environment - Food production	**Why do I look like I do?** -Reproduction -DNA -Inherited disorders - Selective breeding -Genetic engineering -Cloning	**Why have organisms changed over time?** -Evolution -Fossils -Extinction -Speciation	Revision and Exams	Exams

Science - Biology Curriculum – KS5 Overview

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

Science - Chemistry Curriculum – KS3-KS4 Overview

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
9	**Understanding the basics of Chemistry:** Elements, compounds, mixtures. The atom and the periodic table	**Understanding more about the Atom:** What makes up atoms?	**Chemical Bonding and the properties of matter.** What are the types of chemical bonds that form	**Understanding Metals and their properties.**	**The properties of covalent and ionic substances**	**The properties of covalent and ionic substances linked to their uses**
10 Separate Chemistry	**Chemical changes.** What are the key chemical changes that occur?	**The calculations we need for chemistry.**	**The calculations we need for chemistry. Understanding energy changes in chemical reactions.**	**Understanding energy changes in chemical reactions.**	**How we make use of crude oil?**	**Organic Chemistry- uses of the fractions of crude oil. Alkenes, alcohols, carboxylic acids, esters, polymers.**
10 Trilogy Chemistry	**Chemical changes.** What are the key chemical changes that occur?	**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 Separate Chemistry	**Review of organic chemistry. Chemical analysis.**	**The Evolution of the Earth's Atmosphere Using the Earth's Resources**	**Using the Earth's Resources**	**Using the Earth's Resources**	Revision and Exams	Examinations
11 Trilogy Chemistry	**The Evolution of the Earth's Atmosphere**	**Using the Earth's Resources**	**Revision**	**Revision**	Revision and Exams	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)	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	Revision and exams	Exams

Science - Physics Curriculum – KS3-KS4 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 -Weight and gravity -Newton's Laws	**Topic: Electricity** -Circuit symbols and diagrams -Current and Potential difference -Resistance	**Topic: Magnetism** -Magnetic fields -Induced magnetism -Compasses -Electromagnetism	**Topic: Mains electricity** -AC and DC supplies -Electrical safety -3 pin plugs
Y10 Trilogy Physics	**Topic: Particle model of matter** -Density -Changes in temperature related to kinetic energy of particles -Changes in state -Gas pressure & temperature	**Topic: Atomic structure and radiation** -Theory of atomic structure -Radioactive decay -Decay equations and properties -Uses and dangers of radiation -Half life	**Topic: Electricity and circuits** -Circuit components -Circuit diagrams -Current, potential difference and resistance	**Topic: Electricity and circuits** -Series and parallel circuits -IV characteristics -Thermistors and LDRs	**Topic: Energy** -Energy stores and transfers review -Kinetic, gravitational and elastic potential energy	**Topic: Forces** -Scalars and vectors -Contact and non-contact forces -Newton's Laws
Year 10 Separate Physics	**Topic: Particle model of matter** -Density -Changes in temperature related to kinetic energy of particles -Changes in state -Gas pressure & temperature -Gas pressure and volume	**Topic: Atomic structure and radiation** -Theory of atomic structure -Radioactive decay -Decay equations and properties -Uses and dangers of radiation -Half life -Background radiation Fission and fusion	**Topic: Electricity and circuits** -Circuit components -Circuit diagrams -Current, potential difference and resistance	**Topic: Electricity and circuits** -Series and parallel circuits -IV characteristics -Thermistors and LDRs -Static and fields	**Topic: Energy** -Energy stores and transfers review -Kinetic, gravitational and elastic potential energy	**Topic: Forces** -Scalars and vectors -Contact and non-contact forces -Newton's Laws

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y11 Trilogy	**Topic: Forces** -Elasticity -Distance and displacement -Speed and velocity -Time graph relationships -Acceleration -Stopping distances -Momentum (Higher)	**Topic: Waves** -Wave properties -Wave speed and frequency	**Topic: Waves** -Electromagnetic spectrum	**Topic: Electromagnetism** -Magnetic fields -Electromagnetism -Motor effect (Higher) **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 -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 -	**Topic: Waves** -Lenses and light -Black body radiation **Topic: Electromagnetism** -Magnetic fields -Electromagnetism	**Topic: 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	**(Teacher A)** **Mechanics** -Vectors -Moments -SUVAT and projectiles **(Teacher B)** **Particles and Radiation** -Matter and Radiation -Quarks and Leptons	**(Teacher A)** **Mechanics** -Forces -Momentum -Work and conservation of energy **(Teacher B)** **Particles and Radiation** -Quantum phenomena -Photoelectric effect -Energy levels and spectra	**(Teacher A)** **Electricity** -Basics of electricity -Current-voltage characteristics -Resistivity **(Teacher B)** **Waves and Optics** -Wave properties -Stationary and progressive waves	**(Teacher A)** **Electricity** -Potential divider -EMF and internal resistance **(Teacher B)** **Waves and Optics** -Refraction -Total Internal Reflection -Interference	**(Teacher A)** **Materials** -Bulk properties of solids -Young modulus **(Teacher B)** **Waves and Optics** -Diffraction -Diffraction grating	**(Teacher A)** **Further mechanics** -Rotational motion **(Teacher B)** **Radioactivity** -Properties -Decay and decay modes

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y13	**(Teacher A)** **Further mechanics** -Rotational motion review -Simple harmonic motion and resonance **(Teacher B)** **Fields** -Gravitational Field -Electric Field	**(Teacher A)** **Further mechanics** -Thermal Physics -Gas laws **(Teacher B)** **Fields** -Capacitors -Magnetic Field	**(Teacher A)** **Engineering Physics** -Moment of inertia and kinetic energy -Acceleration -Torque -Flywheels **(Teacher B)** **Fields** - Electromagnetic Induction	**(Teacher A)** **Engineering Physics** -Thermodynamics -PV diagrams -Engines -Heat engines -Reversed heat engines **(Teacher B)** **Nuclear Energy** -Energy & mass -Binding energy -Fission & Fusion	**Revision** **Exam period**	**Exam period**