Science Curriculum Map Overview

Please note further information can be found in the KS3 Science curriculum sequencing document

DEYES HIGH SCHOOL
LYDIATE LEARNING TRUST

Key Stage 3

KS3 Year 7	Half term 1 Autumn 1	Half term 2 Autumn 2	Half term 3 Spring 1	Half term 4 Spring 2	Half term 5 Summer 1	Half term 6 Summer 2
Topic/content	**Introduction to lab safety:** symbols, Variables, units and equipment. **Cells 1 and Bioenergetics 1** Animal and plant cells, microscopes, photosynthesis.	**Atoms 1: Particle theory** Properties of matter, Changes of state, purity distillation. **Energy 1: Energy stores and transfers** Energy in fuels, energy stores, work done.	**Inheritance 1.** Puberty, fertilisation, menstrual cycle, pregnancy, Plant reproduction, seed dispersal.	**Chemical reactions 1: Acid and Alkali.** Properties of acids and alkalis, indicators, neutralisation, naming salts, word equations. **Space 1 Earth and the universe.** Solar system, earth, sun and moon, eclipses, Universe, Alien life.	**Human Health 1** Organisation, Biomechanics of the muscles and movement, gas exchange, exercise, smoking, asthma. **Atoms 2: Atoms and Elements** Atoms and compounds, simple chemical reactions, word equations, chemical and physical change.	**Forces 1: Forces and Motion 1.** Forces, free body diagrams, contact and non-contact forces, friction, air resistance, distance time graphs.

KS3	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6

Year 8	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic/content	**Waves 1: Sound** Waves, pitch, structure of the ear, echoes, ultrasound, waves and hospital equipment. **Human Health 2 and 3 Digestive system and food test.** Balanced diets, digestion, food tests, malnutrition and deficiencies, absorption.	**Atoms 3: Periodic table** Structure of atoms, periodic table, Metals and non-metals, Properties of group 1, 7 and 0 elements. Early periodic table.	**Waves 2: Light** Reflection of light, Refraction of light, structure of the eye, colour. **Particle motion 1.** pressure in gases, liquids and solids. **Cells 2 and Bioenergetics 2:** Plant organs, diffusion, osmosis and active transport, photosynthesis, factors affecting photosynthesis.	**Separating 1 techniques:** Solute, solvent, solution, pure and impure substances applications of distillation, filtration and chromatography, word equations for simple reactions.	**Particle Model 2: Energy and Atom decay.** Kinetic energy, density, internal energy, the atom, atom decay. **Ecology 1 and 2: Ecosystems and Interdependence.** Food chains and webs, interdependence, pyramid of numbers, bioaccumulation, endangered species, pollination and food security.	**Earth Chemistry 1:** Structure of the earth, types of rocks, biological and physical weathering, metals in rocks, extraction of metals, the atmosphere, human activity.

KS3 Year 9	Half term 1 Autumn 1	Half term 2 Autumn 2	Half term 3 Spring 1	Half term 4 Spring 2	Half term 5 Summer 1	Half term 6 Summer 2

Biology	**Bioenergetics 2 and ecology2: Respiration and cycles.** Importance of respiration, aerobic and anaerobic respiration, fermentation, energy transfer through food webs revisit, pyramid of biomass, carbon cycle, water cycle, decay and nutrient recycling.	**Inheritance 2: DNA, evolution and gene banks.** DNA extraction, DNA discovery, variation, inheritance natural selection, evolution, extinction, gene banks, fingerprinting.	**Biology how science works CPAC unit.** Microscopy, biological drawings, osmosis practical, food tests revisit, enzymes, photosynthesis practical. Analysis and improvements
Chemistry	**Chemical reactions 2: Metals and acids** Metal and acid word and symbol equations, Metal and oxygen word and symbol equations, metal displacement reactions, extracting metals, ceramics, polymers, composite, nanoparticles, hybrid cars.	**Energy in chemical reactions 1: Endothermic and exothermic reactions.** Oxidation, combustion, decomposition, reactivity series, displacement reactions revisit, metal extraction revisit, catalyst, polymers revisit.	**Energy in Chemical reactions 2:** Endothermic and exothermic reactions, Sc1 skills, Bond energies, applications of exothermic and endothermic reactions. Fire triangle, decomposition, balancing equations.
Physics	**Forces 2: Contact and non-contact forces.** Squashing and stretching, contact forces revisit, free body diagrams revisit, streamline shapes, Hooke's Law, drag and friction.	**Electricity and Magnetism: Circuits and magnetic fields.** Charging up, circuits potential difference, series and parallel, resistance. Magnets, magnetic fields, electromagnets.	**Energy 2: Simple machines and energy transfers.** Turning forces, moments. Levers, forces and energy, simple machines, work done, energy transfer between stores. Conduction, convection and radiation.

Science Curriculum Map Overview

Please note further information can be found in the Biology, Chemistry and Physics curriculum sequencing documents

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Key Stage 4

KS4 Year 10	Half term 1 Autumn 1	Half term 2 Autumn 2	Half term 3 Spring 1	Half term 4 Spring 2	Half term 5 Summer 1	Summer 2
Biology	**Cells 3 Cell division** Cell cycle and mitosis, stem cells, Microscopy.	**Human Health 4: Circulatory and disease** Heart, blood composition, blood vessels, CHD, cancer, gas exchange.	**Human Health 5: Infectious disease** Pathogens, transmission, Immune responses, Vaccinations, drug development, plant disease, monoclonal antibodies.	**Bioenergetics 3: Photosynthesis and respiration** Factors affecting photosynthesis, respiration equations, oxygen debt.	**Homeostasis 1: Nervous system** Homeostasis, nervous system, reaction times, brain, eye, controlling body temperature.	**Ecology 3: Human interaction on ecosystems** Biodiversity, deforestation, global warming, waste management, farming methods, sustainable fishing, and biotechnology.
Chemistry	**Atoms 4: Atomic structure** Balancing equations, mixtures, development of atomic models, electron structure . **TM**	**Bonding 1: Bonding and the properties of materials** Chemical bonds, chemical structures, formation of ions.	**Quantitative Chemistry 1: Calculations used in chemistry** Conservation of mass, formula mass, Moles, reacting mass, concentration of solution. **% Yield, Atom economy, gas volume**.	**Chemical changes 2: extracting metals from the Earth** Salt production, pH scale and neutralisation, electrolysis.	**Energy changes 2: Energy changes and measurements in reactions** RP temperature change, chemical cells, fuel cells	**Rate of reaction 2: Measuring and changing rates in reactions.** Factors affecting rate, reversible reactions, Le Chatelier's principle.
Physics	**Energy 3: Energy applications** Stores and transfer, efficiency, work and power, energy resources.	**Electricity 3: PD, current and resistance** Current and charge, Ohm's Law, IV, Thermistors and LDR's, Circuits.	**Particles 3: Particle model of matter** Particles and density, changes of state, Internal energy, specific latent heat and heat capacity. Boyle's law.	**Electricity 4.** Electrical safety, power, national grid electrostatics and electric fields.	**Atoms 3: Atomic Structure** Ions and isotopes, radioactive decay, types of radiation, nuclear equations, half life	**Atoms 3: Fission and Fusion (separates only)** Fission and fusion, uses of nuclear radiation. **Forces 4: Newton's laws** Free body diagrams, weight and mass, air resistance, newtons three laws. Hooke's law.

KS4 Year 11	Half term 1 Autumn 1	Half term 2 Autumn 2	Half term 3 Spring 1	Half term 4 Spring 2	Half term 5 Summer 1	Half term 6 Summer 2
Biology	**Homeostasis 2 Endocrine system** Blood Glucose, Menstrual cycle, Contraception, water and nitrogen cycle, kidney, plant hormones, tropism.	**Inheritance 3: Reproduction** Meiosis, sex determination, genetic disease, DNA structure and analysis, protein synthesis, Mendel.	**Inheritance 4: Variation and Evolution** Natural selection and evolution, resistant bacteria, Evidence of evolution, variation and selective breeding, genetic engineering, classification, cloning.	**Revisit Curriculum** Required practical's and SC1 skills. Past paper practice.	**Revisit Curriculum** Stretch and challenge questions practicing application of key concepts.	
Chemistry	**Organic Chemistry 1: Derivatives of crude oil** Fractional distillation, structures of alkanes, cracking, **structures of alkenes, polymerisation, structures of alcohols and carboxylic acids. Peptides and DNA**.	**Chemical analysis 2: Identifying unknown substances** RP Chromatography calculating RF, testing for gases. **Metal ions, metal hydroxides flame emission spectrometry.**	**Earth Chemistry 2: Evolution of the atmosphere** Early atmosphere, changes in the atmosphere, greenhouse gases, climate change, carbon footprint, combustion	**Using resources 1: Water resources and chemistry applications** Sustainable development, potable water wastewater, LCA's, Reduce, reuse, recycle.	**Revisit Curriculum**	
Physics	**Waves 3.** Types and speed of sound Wave equation, EM spectrum, refraction, Em absorption, **(Application of waves separates only)** Reflection, sound, ultrasound, x-rays, lenses, coloured light.	**Forces 5: Mechanics** Velocity and displacement, distance time graphs, acceleration, velocity time graphs, SUVAT, terminal velocity, stopping distance, momentum.	**Forces 5: Further mechanics (separates only)** Velocity and collisions, Impact, terminal velocity, moments, equilibrium, pressure, fluid pressure. **Magnetism 3: Magnetism and electromagnetism** Induced, electromagnetism, Flemmings L hand rules, Electric motors, induction, generators and transformers.	**Space 3: Space physics (separates only)** Solar system Orbits, Stellar evolution, red shift and the big bang **Revisit Curriculum**	**Revisit Curriculum**	

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DEYES HIGH SCHOOL
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Key Stage 5

KS5 Year 12	Half term 1 Autumn 1	Half term 2 Autumn 2	Half term 3 Spring 1	Half term 4 Spring 2	Half term 5 Summer 1	Half term 6 Summer 2
Biology	Biological Molecules Cells	Biological Molecules Cells .	Genetic information, variation, relationships between organisms. Organisms exchange substances with their environment			
Chemistry	Atomic structure Amount of Substance Periodicity Group 2 Group 7	Bonding Introduction to Organic Chemistry Alkanes Haloalkanes	Bonding Energetics Alkenes	Kinetics Equilibria Redox Alcohols	Organic analysis Aldehydes and Ketones Optical isomerism	Period 3 End of Year As paper practice.
Physics	Measurements and errors Particles Forces (mechanics)	Electromagnetic radiation and quantum phenomena Motion (mechanics) Energy and momentum (mechanics)	Materials Progressive and stationary waves	Progressive and stationary waves Current electricity	Refraction, diffraction and interference Electric circuits	Periodic motion

KS5 Year 13	Half term 1 Autumn 1	Half term 2 Autumn 2	Half term 3 Spring 1	Half term 4 Spring 2	Half term 5 Summer 1	Half term 6 Summer 2

Biology	**Energy transfers in and between organisms** **Organisms respond to changes in their external and internal environments**		**Genetics, populations, evolution and ecosystems** **The control of gene expression**		**Exam preparation and revision**	
Chemistry	**Thermodynamics** **Transition Metals** **Aqueous solutions**	**Electrochemical cells** **Carboxylic acids** **Acids and bases** **Biochemistry** **Synthetic Pathways**	**Acids and bases** **NMR** **Polymers** **Organic synthesis**	**Chromatography**	**Exam preparation and revision**	
Physics	**Thermal physics** **Gravitational fields**	**Electric fields** **Capacitance** **Magnetic fields**	**Radioactivity** **Telescopes** **Classification of stars**	**Nuclear physics** **Cosmology**	**Measurements and errors (revisit)** **Exam preparation and revision**	