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BARLBY HIGH SCHOOL

Curriculum Overview for Science KS3

The table below details the skills and knowledge students will be covering each half term in Year 7 in this subject area.

	HT1	HT2	HT3	HT4	HT5	HT6
Knowledge and skills covered this year	**Safety in the laboratory:** *equipment, measuring skills, assessing risks.* **Materials-substances and properties:** *Composites, material properties, polymers* **Particles- particles and structure:** *States of matter, the particle model, evaporation, melting and boiling points, diffusion, brownian motion* **Cells- the cellular basis of life:** *Plant and animal cells, structures in cells, specialised cells, diffusion in cells*	**Energy and energy stores:** *Energy stores, conservation of energy, conduction, convection and radiation* **Body systems**: *skeleton function, joints and muscles breathing, organisation in animals* **Separation techniques:** *Pure substances and mixtures, solutions, Filtration, decanting, immiscibility, distillation, chromatography*	Assessment prep **Forces and motion:** *Squashing and stretching, measuring forces, friction, streamlining, balanced and unbalanced forces* **Atoms and Elements:** *The periodic table, atoms, elements, compounds, metals and non metals, chemical formulae*	Science week activities **Reproduction - in plants and animals:** *Plant reproduction, plant structure, fertilisation in plants and life cycles, puberty and adolescence, human reproductive system and cycle, menstrual cycle, fetus development*	**Sound and Light:** Waves, sound and energy transfer, echoes, ultrasound, light, laws of light reflection and refraction, the eye and the camera, colour **Energy 2- Power and energy resources:** *Power and energy, energy in the home, renewable energy resources, energy in food, non renewable energy*	Assessment prep ***Space:*** *Gravity, the night sky, the solar system, day and night*

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The table below details the skills and knowledge students will be covering each half term in Year 8 in this subject area.

	HT1	HT2	HT3	HT4	HT5	HT6
Knowledge and skills covered this year	**Elements and the Periodic Table:** *The periodic table, atoms, elements, compounds, metals and non metals, chemical formulae* **Forces and Pressure:** *Equilibrium in force systems, stretching and Hooke's law, moments of forces*	**Breathing and Digestion:** *Lung function and respiration, illness and lung conditions, smoking, digestive system structure, digestion processes, healthy diet.* **Evolution and inheritance:** *environmental and inherited characteristics, DNA, genes chromosomes and inheritance, hereditary diseases. DNA research.*	**Evolution and inheritance:** *environmental and inherited characteristics, DNA, genes chromosomes and inheritance, hereditary diseases. DNA research.* **Magnetism:** *Bar magnets, attraction and repulsion, magnetic fields, electromagnets, electromagnetic devices.*	Science week activities **Chemical reactions:** *chemical formula and compounds, writing equations, oxidation, neutralisation, displacement, reactions of metals and non-metals with acids.*	**Chemical reactions**: *chemical formula and compounds, writing equations, oxidation, neutralisation, displacement, reactions of metals and non-metals with acids.* **Waves:** *Waves, sound and energy transfer, echoes, ultrasound, light, laws of light reflection and refraction, the eye and the camera, colour*	**Earth and Resources:** *Rocks and rock cycles. Resources from the Earth, finite resources.*

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The table below details the skills and knowledge students will be covering each half term in Year 9 in this subject area.

	HT1	HT2	HT3	HT4	HT5	HT6
Knowledge and skills covered this year	**Cell biology-** *microscopy, structure and cell processes, eukaryotes and prokaryotes, cell specialisation, osmosis and diffusion, active transport. Exchange surfaces.* **Mixtures and Separation-** *pure substances, mixtures and formulations, techniques and chromatography and gas identification,*	**Conservation and dissipation of energy:** *Energy stores and transfers, power and work, GPE and KE transfers and calculations, energy dissipation, efficiency.* **Cell division- and the cell cycle:** *DNA and the genome, cell cycle and mitosis, stem cells, ethics* **Atomic Structure:** *Atoms, elements and compounds*	Assessment preparation **Atomic structure** (cont): *Atoms, elements and compounds recap, chemical equations and balancing equations, structure of the atoms, p n and e, isotopes.* **Energy by Heating/Energy resources:** *Conduction, insulators, heating the home, renewable and non- renewable resources.*	**Organisation and the digestive system:** *Principles of organisation, the digestive system, chemistry of food, enzymes, making digestion efficient,* Science week **Periodic table:** *Development of the periodic table, the modern periodic table, Group 1, Group 7, Group 0, Transition metals and their properties*	**Transport in animals- blood, the heart, breathing:** *Blood, blood vessels and transport, the heart and structure, heart disease, breathing,* **The Earth's atmosphere:** *The Atmosphere structure, global warming and acid rain, carbon footprint, pollutants* **Particle model and matter-** *density and SHC, internal energy of substances., latent heat and*	**Organisms and their environments:** *Food chains and webs, populations and community, interdependence, biodiversity, competition and adaptations.*

		recap, chemical equations and balancing equations, structure of the atoms, p n and e, isotopes.			*the particle model*	

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Curriculum Overview for Science KS4

The table below details the skills and knowledge students will be covering each half term in Year 10 in this subject area.
Awarding Organisation: AQA

	HT1	HT2	HT3	HT4	HT5	HT6
Knowledge and skills covered this year	Energy and Work: *Energy stores and transfers, power and work, GPE and KE transfers and calculations, energy dissipation, efficiency. Conduction, insulators, heating the home, renewable and non- renewable resources.* Atomic structure and the periodic table: *Atoms, elements and compounds recap, chemical equations and balancing equations,*	Particle model: *density and SHC, internal energy of substances., latent heat and the particle model* Bonding, structure and properties: Covalent bonding and simple covalent substances, giant structures, ionic bonding,	Organisation: *Principles of organisation, the digestive system, chemistry of food, enzymes, making digestion efficient, Blood, blood vessels and transport, the heart and structure, heart disease, breathing,* Assessment preparation	Electricity: *Circuits series and parallel,, circuit calculations, resistance, power, the National Grid, electric fields* Quantitative chemistry: *The mole, relative formula mass, balancing equations and calculating amounts, mass conservation,*	Infection and response: *Viral, bacterial and fungal disease, methods of transmission, vaccination and drugs, monoclonal antibodies, plant diseases and defences* Radioactivity: *Development of the atomic model, isotopes, radioactive decay and nuclear equations, half life, background radiation and exposure, contamination and irradiation*	Bioenergetics: *Photosynthesis, respiration and metabolism, exercise* Assessment preparation and feedback.

	structure of the atoms, p n and e, isotopes. Development of the periodic table, the modern periodic table, Group 1, Group 7, Group 0, Transition metals and their properties Cell biology: *microscopy, structure and cell processes, eukaryotes and prokaryotes, cell specialisation, osmosis and diffusion, active transport. Exchange surfaces. DNA and the genome, cell cycle and mitosis, stem cells, ethics*					

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The table below details the skills and knowledge students will be covering each half term in Year 11 in this subject area.
Awarding Organisation: AQA

	HT1	HT2	HT3	HT4	HT5	
Knowledge and skills covered this year	Atomic structure and radioactivity *Development of the atomic model, isotopes, radioactive decay and nuclear equations, half life, background radiation and exposure, contamination and irradiation* Chemical and energy changes: *Exothermic and endothermic, bond energies, cells and batteries* Forces: *Resultant forces and work, stretching,*	Assessment prep Organic chemistry: *Hydrocarbons Crude oil and cracking, alkenes and polymers.* Chemical analysis: *Purity and formulations, mixtures and chromatography, tests for gases.* Ecology: *Food chains and webs, populations and community, interdependence, biodiversity, competition and adaptations. The carbon cycle and decay,*	Homeostasis and response: (cont): Rates of chemical change: Rates of reaction, using graphs, reversible reactions. Inheritance, variation and selection: *DNA, reproduction and meiosis, genetic diagrams, variation, evolution, genetic engineering, fossils, classification*	Chemistry of the atmosphere: *Evolution of the atmosphere, climate change, pollution.* Using resources: *Finite and renewables, recycling, life cycle assessments, Water.* Magnetism: *Permanent and induced magnets, electromagnetism electromagnetic devices.*	Exam preparation	

	pressure in gases, Newtons laws, acceleration, motion graphs,road safety, momentum Homeostasis and response: *The nervous system, reflexes and synapses,the endocrine system, puberty and the menstrual cycle, controlling fertility, other hormones.*	*deforestation and land use.*				