



Science

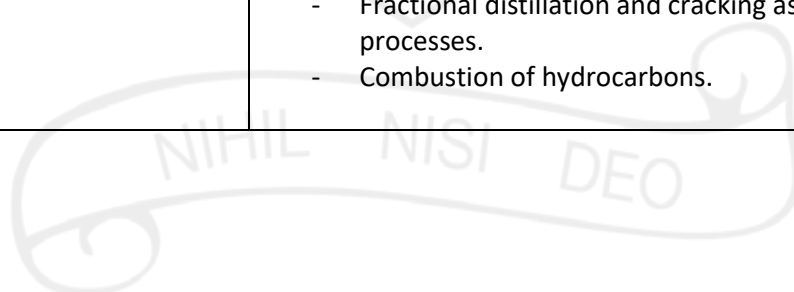


Curriculum Overview Key Stage 3&4

KEY STAGE 3		
	Topic	Key Themes
YEAR 7	Particles and separation (and introduction to Science) (Term 1)	<ul style="list-style-type: none">- Introduction to the laboratory- Scientific equipment- Using equipment safely- The particle model of matter- Changes of state- Separating mixtures- Solubility- Chemical and Physical changes
	Forces and Space (Term 2)	<ul style="list-style-type: none">- The solar system- Days, nights, seasons and orbits- Travel in space- Contact and non-contact forces- Forces and their effects
	Cells and Systems (Term 3)	<ul style="list-style-type: none">- Life processes- Cells, tissues, organs and organ systems

		<ul style="list-style-type: none"> - Uni and multi-cellular organisms - Levels of organisation - Skeletal and muscular systems
	Acids, metals and rocks (Term 4)	<ul style="list-style-type: none"> - The rock cycle. - Structure of the Earth - Weathering and erosion - Acids, alkalis and the pH scale - Reactions of acids - Metals and non-metals
	Light and sound (Term 5)	<ul style="list-style-type: none"> - Types of waves and their uses - How waves interact with different materials - The human body and waves.
	Plants and reproduction (Term 6)	<ul style="list-style-type: none"> - Reproduction in plants and animals - The menstrual cycle - Contraception, fertilisation, pregnancy and birth
	Topic	Key Themes
YEAR 8	Energy (Term 1)	<ul style="list-style-type: none"> - Energy stores and transfers - Useful and wasted energy - Methods of energy transfer - Saving energy at home - Energy generation - Renewable and non-renewable energy sources
	Health (Term 2)	<ul style="list-style-type: none"> - Essential nutrients for life - Balanced diets and health implications - The digestive system and enzymes - Food tests and investigative skills - Respiratory and circulatory systems - Drugs, alcohol and their effect on the body
	Matter and reactions (Term 3)	<ul style="list-style-type: none"> - Elements, compounds and mixtures - Chemical formulae - Structure of the periodic table - Chemical reactions - Mass and energy changes in reactions - Representing reactions
	Electricity and magnetism (Term 4)	<ul style="list-style-type: none"> - Circuit diagrams and symbols - Measuring current, resistance and voltage - Electrical safety in the home - Series and parallel circuits

		<ul style="list-style-type: none"> - Basic principles of magnets - Electromagnets and their uses - Magnetic fields
	Ecology (Term 5)	<ul style="list-style-type: none"> - Adaptations of plants and animals - Energy transfers in habitats - Feeding relationships - Variation, evolution, and inheritance
	Environmental Chemistry (Term 6)	<ul style="list-style-type: none"> - Carbon cycle and the greenhouse effect - The impact humans are having on the environment - Reduce, reuse, recycle - Measuring and evaluating environmental impact
	Topic	Key Themes
YEAR 9	Atomic structure	<ul style="list-style-type: none"> - Atoms and radiation - Types of radiation, their properties and their uses - Dangers of radiation
	Cell Biology	<ul style="list-style-type: none"> - Looking at cells. - Eukaryotic and prokaryotic cells. - Cell specialisation. - Transport of substances in and out of cells. - Cell division. - Stem cells and the dilemmas of using them.
	Particle model of matter	<ul style="list-style-type: none"> - Changes of state and internal energy changes - Density of objects - Gas pressure and the factors that affect it.
	Atomic structure and the periodic table	<ul style="list-style-type: none"> - Structure of the atom and links to the periodic tables - Groups in the periodic table - Trends and patterns in reactivity - Representing and interpreting chemical reactions
	Energy part 1: Energy transfers	<ul style="list-style-type: none"> - Changes in energy stores. - Energy dissipation and energy efficiency. - Electrical appliances, energy, and power.
Organic Chemistry	<ul style="list-style-type: none"> - Crude oil as a resource - Fractional distillation and cracking as industrial processes. - Combustion of hydrocarbons. 	



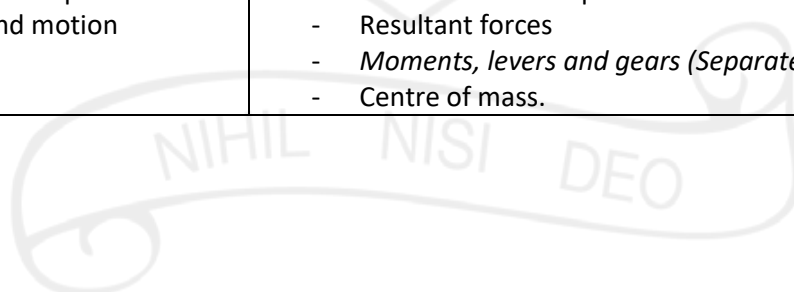
	<p>The rate and extent of chemical change part 1: Rates of reaction and reversible reactions</p> <p>Organisation</p>	<ul style="list-style-type: none"> - Scientific skills – Accurately measuring the rate of a reaction using appropriate methods. - Factors affecting the rate of reaction. - Reversible reactions and dynamic equilibrium. <ul style="list-style-type: none"> - The digestive system in detail - The chemistry of food. - Enzymes and the factors that affect them. - Making digestion efficient. - Circulatory system, blood vessels and the heart. - Respiratory system – breathing and gas exchange. - Tissues and organs in plants. - Transport systems in plants.
	<p>Chemistry of the atmosphere</p>	<ul style="list-style-type: none"> - Composition and evolution of the atmosphere. - Carbon cycle and the impact of humans. - Greenhouse gases and global climate change. - Atmospheric pollutants

KEY STAGE 4

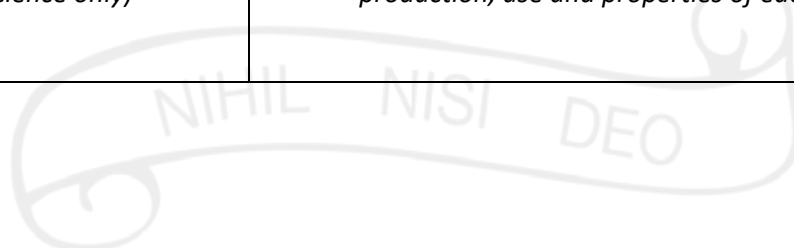
Examination Specification: AQA Separate Science (Pathway 1) and AQA Trilogy Combined Science (Pathway 2)

	Topic	Key Themes
YEAR 10	<p>Biology</p> <p>Infection and response</p>	<ul style="list-style-type: none"> - Pathogens and the spread of disease. - Types of pathogens. - How the human body defends against disease. - Vaccines and antibiotics. - Development of new drugs. - Non-communicable diseases and lifestyle choices.
	<p>Bioenergetics and respiration</p>	<ul style="list-style-type: none"> - Photosynthesis and the factors that affect it. - Aerobic and anaerobic respiration. - Metabolism and the liver.
	<p>Homeostasis and response</p>	<ul style="list-style-type: none"> - Principle of homeostasis. - The nervous system and reflex actions.

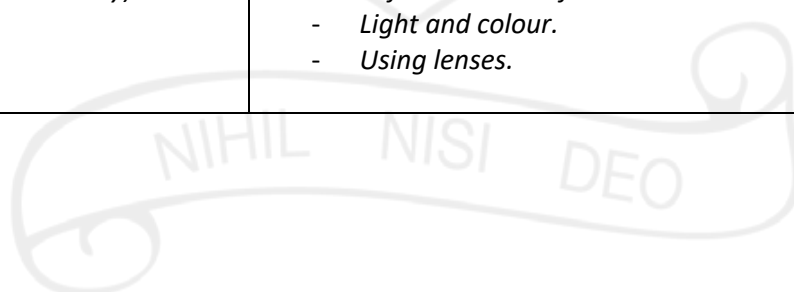
		<ul style="list-style-type: none"> - <i>The brain, eye and common problems (Separate Science only).</i> - Hormonal control. - Diabetes and negative feedback. - Human reproduction and the role of hormones. - Hormones as a method of controlling fertility. - <i>Plant hormones and responses (Separate Science only).</i> - <i>Controlling body temperature (Separate Science only).</i> - <i>Controlling water content, associated issues and treatment. (Separate Biology only).</i>
	<p>Chemistry</p> <p>Bonding, structure and the properties of matter</p> <p>Quantitative Chemistry</p> <p>Chemical changes part 1: Reactions of metals</p> <p>Energy changes</p>	<ul style="list-style-type: none"> - Ionic, covalent and metallic bonding. - Properties associated with each type of bonding. - Nanoscience, nanoparticles, their uses and implications. - Relative formula mass and the mole. - Reacting masses and conservation of mass. - Yield and atom economy in industrial reactions. - Analytical techniques (Separate Science only). - The reactivity series and determining how to extract useful resources. - Reactions of metals and scientific technique. - Neutralisation, acids and alkalis, and the pH scale. - Energy transfers in reactions. - Energy profile diagrams. - Calculating energy changes in reactions - Fuel cells and their use as an alternative to fossil fuels.
	<p>Physics</p> <p>Electricity</p> <p>Forces part 1: Forces and motion</p>	<ul style="list-style-type: none"> - Current, charge, potential difference, and resistance. - Component characteristics. - Series and parallel circuits. - Alternating and direct current. - Cables, plugs and electrical safety. - Appliances and efficiency. - Vector and scalar quantities. - Resultant forces - <i>Moments, levers and gears (Separate Science only).</i> - Centre of mass.



	Waves part 1: Waves	<ul style="list-style-type: none"> - <i>Moments and equilibrium (Separate Science only).</i> - Resolution of forces. - The nature and properties of waves. - Reflection and refraction. - <i>Sound waves and the use of ultrasound (Separate Science only).</i>
	Topic	Key Themes
YEAR 11	Biology	
	Inheritance, variation and evolution	<ul style="list-style-type: none"> - Types of reproduction and cell division. - Inheritance in action. - Inherited diseases and screening for disease. - Variation and evolution. - Natural selection and selective breeding. - Genetic engineering and cloning. - The history of genetics. - Evolution and speciation, including the evidence for each. - Extinction. - Classification.
	Ecology	<ul style="list-style-type: none"> - Organisms in their environment. - Distribution and abundance of organisms. - Competition in plants and animals. - Adaptations in plants and animals. - Feeding relationships, material cycling and the carbon cycle. - Land, water, and air pollution. - Destruction of habitats. - Biodiversity, and maintaining it. - Sustainable food production.
Chemistry		
	Rate and extent of chemical change part 2: Le Chatelier's principle and dynamic equilibrium	<ul style="list-style-type: none"> - Dynamic equilibrium and how it relates to reversible reactions. - The effect of changing conditions on the position of equilibrium, yield and rate. - The economics of industrial reactions and compromises.
	<i>Organic Chemistry part 2: Organic reactions (Separate Science only)</i>	<ul style="list-style-type: none"> - <i>Reactions of alkenes to make further useful products.</i> - <i>Alcohols, carboxylic acids and esters – The production, use and properties of each.</i>



	<p><i>Organic Chemistry part 3: Polymers (Separate Science only)</i></p> <p>Chemical analysis</p> <p>Using resources</p>	<ul style="list-style-type: none"> - <i>Types of polymers, the conditions under which they are made uses.</i> - <i>Natural polymers, linking to D.N.A. structure</i> - <i>Chromatography and it's use as an analytical technique.</i> - <i>Testing for gases.</i> - <i>Laboratory and Industrial analytical techniques, and their advantages and disadvantages (Separate Science only).</i> - <i>Finite and renewable sources, sustainability and carbon footprints.</i> - <i>Treatment of water as a resource.</i> - <i>Alternative methods for extracting metals</i> - <i>Life cycle assessments</i> - <i>Reducing, reusing, and recycling resources.</i> - <i>Bespoke materials and their properties (Separate Science only).</i>
	<p>Physics</p> <p>Forces part 2: Motion and acceleration</p> <p><i>Forces part 3: Impacts and pressures (Separate Science only)</i></p> <p>Energy part 2: Energy and heat transfers</p> <p><i>Waves part 2: Light and lenses (Separate Science only)</i></p>	<ul style="list-style-type: none"> - <i>Distance-time and velocity-time graphs.</i> - <i>Analysing motion graphs.</i> - <i>Force and acceleration.</i> - <i>Weight and terminal velocity.</i> - <i>Momentum and conservation.</i> - <i>Impact forces and safety (Separate Science only).</i> - <i>Pressure in gases and liquids.</i> - <i>Upthrust and flotation.</i> - <i>Thermal energy transfer by conduction, convection and radiation.</i> - <i>Specific heat capacity.</i> - <i>Heating and insulating buildings.</i> - <i>Energy generation and meeting demands.</i> - <i>Energy and the environment.</i> - <i>The electromagnetic spectrum.</i> - <i>Uses and dangers of the electromagnetic spectrum.</i> - <i>Reflection and refraction.</i> - <i>Light and colour.</i> - <i>Using lenses.</i>



	<p>Magnetism and electromagnetism</p> <p>Space Physics (Separate Science only)</p>	<ul style="list-style-type: none"> - Magnetic fields and current. - Electromagnets in devices. - The motor effect and <i>generator effect (Separate Science only)</i>. - <i>A.C. generators. (Separate Science only)</i>. - <i>Transformers (Separate Science only)</i>. - <i>Formation of the solar system.</i> - Life cycle of stars. - The beginning and the future of the Universe.
--	--	---

