

Science at Serlby Park Academy

We believe that students deserve a broad, progressive, and ambitious Science curriculum, rich in skills and knowledge, which stimulates curiosity and a wonder of their world and prepares them well for future learning or employment.

The science curriculum for the students of Serlby Park Academy has been designed to provide students with a deep understanding of the scientific knowledge and ideas that impact them as individuals within a local and globalised context. As they move through the curriculum, students will be increasingly made to develop their curiosity, provide insight into working scientifically and appreciate the value of science in their everyday lives. Our curriculum provides a platform for more advanced science-based study, providing a gateway into a wide range of career opportunities. It also delivers a framework for understanding the natural world and supporting students to become scientifically literate participants in society.

SPA Programme of study

Our programme of study follows a cyclic approach where each topic from KS3 to KS4 is classified into ten fundamental areas of science which we call **strands**. Within each strand, students will build on prior knowledge as they embark on each learning journey.

The Strands are **Organisms, Origins, Cycles and Interactions**, **Matter, Reactions, Earth & Beyond**, **Energy, Waves, Electricity and Forces**.

New topics begin with a bespoke lesson planned by classroom teachers (Drill and Recap) which revisits prior learning either from KS2 (if it is the first unit from the strand) or from the previous unit that was taught from that strand. This provides any students with gaps in their learning to not be as disadvantaged whilst also reminding students of the fundamental points they learnt previously.

We aim to provide a consistent structure to individual lessons, in which the rationale behind each stage is based on several sources of educational research to provide learning environments and opportunities for all students to learn, make progress and to enjoy the process. Objectives are shared and students are reminded of their current position on the learning journey every lesson.

The overall lesson structure provides an interleaved system that engages and invigorates students promoting a love of learning]

1, **DINT** We begin every lesson with a DINT (Do it Now Task) . These consist of approximately 5 questions which relate to prior learning from the strand. At the start of a new unit, they recap the previous unit from that strand and as we progress through the unit, they recap its earlier content.

The drill questions repeat over a period of 4/5 lessons. They provide students with prior knowledge for that lesson's objectives but also through repetition, begin to improve cognition and retention of the fundamental principles and knowledge from the unit and the strand.

2, CONNECT This task includes pink, yellow and green questions to build on/extend learning from the previous lesson. Students complete the colour question relating to their previous demonstrate task.

Misconceptions, lack of understanding and even lack of challenge from the previous lesson can be addressed immediately in the next lesson using this task. Every connect task is bespoke to each class every lesson.

3, Previously The science programme of study centres around an interleaved approach where previous content is revisited numerous times. This short task either aims to recap content taught from two lessons ago or to remind students about a particular idea or concept from earlier in the unit or strand which they will need to remember and use when learning the new content.

This flipped learning approach prepares students for the objectives of the lesson, whilst also reminding them of previous recent learning, repeating skills and questions or looking at them from a different novel approach (AO3)

4, New CONTENT During this section of the lesson, new content is delivered. Various differentiated strategies including the use of collaborative learning, teacher toolkit, modelling, practical skills are used to ensure all students are engaged and involved.

A mixture of media including animated gifs, videos, flow diagrams and literacy tasks are used to target all varieties of learning styles with a key focus on maintaining the balance of cognition by chunking the new content into smaller, retainable tasks.

5, Demonstrate The Demonstrate task is an independent activity at the end of the learning sequence. It involves an exam or specification-based question which exposes students to the correct format and command words, and allow them to apply what new content they have learnt. This activity should be challenging and assess the extent to which pupils have met the 'What' and 'Why' lesson objective. The Demonstrate task is a pre-planned activity that has relevant challenge but is also scaffolded where necessary.

Teachers immediately track progress and highlight any misconceptions. Whilst reducing their workload and informing their planning for the subsequent lessons.

Year 7 -Science

Year 7	Strand and incorporated topic	Key Skills	Assessment	Big Question	Key Terminology
Term 1	ORGANISMS (cells and movement) Builds on knowledge from KS1 (an organism's basic needs) and KS2- basic nutrition	Using a <u>microscope</u> to observe, interpret and record cell structure Use <u>working scientifically skills</u> to observe diffusion	December Assessment Revisited in June Assessment	What are living things made of? How are the building blocks adapted to be able to carry out their functions?	Nucleus, cytoplasm, cell membrane Chloroplast, vacuole, cell wall Magnification Diffusion Muscle, bone
	Matter (particles and separating mixtures) Builds on KS1 properties of everyday objects and KS2 solids, liquids and gases	Use a variety of scientific techniques including distillation and chromatography to separate mixtures.	December Assessment Revisited in June Assessment	How do particles behave in solids, liquids and gases? How can we separate mixtures?	Solids, liquids, gases, evaporation, condensation, melting, freezing, state, mixture, chromatography, filter, pure, solubility, distillation
	Waves (light and sound) Builds on knowledge from KS2. Light travels in straight lines and how we see	Draw light rays in a variety of situations. Use a protractor to measure angles. Drawing and interpreting wave diagrams	December Assessment Revisited in June Assessment	How do we hear and why can some people hear sounds others cannot? How do we see and why do objects look different colours?	Waves, longitudinal, transverse, wave speed, loudness, amplitude, frequency, pitch, period, ear drum, cochlea, ossicles, reflection, refraction, retina, pupil, iris, optical nerve.
Term 2	Energy (energy cost and transfer) Builds on KS2 knowledge of light, sound and magnetic energy. Pupils may have experience of renewable energy from geography	Identify energy stores and transfers in a variety of situations. Measure the energy stored in samples of food. Compare energy resources and discuss advantages and disadvantages	June assessment	When is work done? How much energy does you food give you? Why do we need to change the ways we generate energy and what method would be best?	Energy stores and pathways, power, work, combustion, renewable, non-renewable, global warning, greenhouse gases
	Reactions (acids and alkali, metals and non-metals) Builds on KS2 understanding of grouping substances based on properties.	Create and use own pH indicator from red cabbage Make a salt using a neutralisation reaction Investigate the reactions of metals with acids, oxygen and water. Investigate displacement reactions.	June Assessment	What happens to chemicals when they react?	Acids, alkalis, neutralisation, pH, indictor, salts, metals, non-metals, displacement

	ORIGINS (Variation and reproduction) Term 2 Builds on knowledge from KS2 where students learn that living things have changed over time	<u>Measurement</u> of characteristics <u>Plot graphs</u> to show continuous and discontinuous variation	June Assessment	What is variation? What are adaptations? How do humans reproduce?	Continuous and discontinuous variation. Adaptation Surface area: volume ratio Gamete Fertilisation Puberty Adolescence Menstrual cycle
	Earth (earth structure and universe) At KS2 students will have studied different types of rocks and soil as well as changes that happen throughout the seasons.	Create a scale model of the solar system. Use models to represent rocks and the rock cycle. Explain how models help us understanding the structure of the Earth.	June Assessment	Why do rocks have different properties? Why do we have day/night and the seasons?	Core, mantle, crust, gravity, sedimentary, igneous, metamorphic, solar system, planets, Earth, Moon, Satellites
	CYCLES and INTERACTIONS: Ecosystems (interdependence and Plant Reproduction) Builds on KS2 Knowledge of life cycles	Draw food chains and pyramids. Examine predator- prey graphs- describe relationships and suggest explanations	June assessment	What is interdependence? How do plants reproduce?	Food chains, webs, energy Interdependence Competition Predator prey Pollination Germination dispersal
Term 3	Electricity (Magnetism) This builds on knowledge of magnets and poles from KS2	Draw and interpret magnetic fields around magnets and electromagnets. Describe how electromagnets are made and explain how they can be used	June assessment	Why do magnets stick to your fridge? How can you get a magnet that you can turn off? How can magnets help when you are lost?	Magnet, magnetic field line, attract, repel, electromagnets, compass
	Forces (speed and gravity) Builds on KS2 knowledge of types of forces and their effects	Identify balanced and unbalanced forces. Calculate speeds of objects and be able to represent motion on graphs Identify the factors that affect weight, rearrange and use the weight equation	June assessment	Why do objects speed up or slow down?	Speed, distance, time,

Year 8 – Science

	Strand and incorporated topic	Key Skills	Assessment	Big Question	Key Terminology
Term 1	Organisms (breathing and digestion) Builds on knowledge of diffusion from Year 7 and KS2 knowledge of living things	<u>Identification</u> of biological molecules (food tests) <u>Use models</u> to look at movement of gases in and out of the lungs	December Assessment	What is meant by a healthy lifestyle? What constitutes a healthy diet?	Diffusion, alveoli Alcohol, smoking Stomach, pancreas, small intestine enzyme
	Electricity (Potential difference and current) Builds on knowledge from KS2 about simple circuits and diagrams.	Draw and interpret circuit diagrams including building circuits from a diagram. Investigate the resistance of component. Build a battery from a piece of fruit	December assessment	Why do our lights stay on? How do thunderstorms work	Charge, current, potential difference, resistance, coulombs, amperes, volts, ohms, static, cells, switch, ammeter, voltmeter, resistor, bulb, series, parallel.
	Matter (elements and the periodic table) Follows on from Year 7 understanding of solids, liquids and gases	Explain the difference between elements, compounds and mixtures Investigate the properties of polymers Describe trends in the periodic table	December Assessment	Why do different materials have different properties?	Elements, compounds, mixtures, Periodic Table, atoms, Alkali metals, Halogens, Displacement, Noble Gases, polymers, chemical formulae

Term 2	Energy (work, heating and cooling) Follows on from year 7 energy (energy cost, resources, and transfers)	Calculate work done by different machines Explain and demonstrate how thermal energy is transferred in solids, liquids and gases.	June assessment	How does a thermos keep your tea hot and your water cold?	Work done, conduction, convection, temperature, thermal, radiation, insulation.
	Reactions (chemical energy and types of reactions) Follows on from year 7 understanding of simple reactions and identifying acids/alkalis	Draw reaction profile diagrams for exothermic and endothermic reactions. Calculate energy changes within a reaction. Investigate further chemical reactions.	June Assessment	What energy transfers happen within chemical reactions?	Combustion, thermal decomposition, conservation, endothermic exothermic, bond
	ORIGINS (evolution and inheritance) Builds on idea of variation from year 7	<u>Use of modelling</u> to determine DNA structure	June assessment	What is evolution? What is Darwin's theory of natural selection? What is biodiversity? How do humans affect the planet?	Chromosome, gene, DNA Natural selection Darwin Evolution Biodiversity, pollution, deforestation
Term 3	Earth (climate and earth resources) Builds on year 7 work on structure of the Earth and the solar system	Investigate paper vs plastic for bag use. Investigate carbonate ores Justify a method of extraction for a specific metal Model the carbon cycle	June assessment	How will global warming and climate change affect me? How do we extract and use the Earth's resources?	Global warming, carbon cycle, photosynthesis, respiration, atmosphere, greenhouse, metals, reduction, electrolysis, ceramics, metal ores

	Cycles and Interactions : Ecosystems (respiration and photosynthesis) Builds on plant reproduction done in year 7	Use working scientifically skills to investigate respiration and photosynthesis	June assessment?	What is an ecosystem? What is meant by interdependence?	Ecosystem Photosynthesis Respiration
	Forces (contact forces and pressure) Follows on from Year 7 forces knowledge of resultant forces and their effects	Describe the effects of friction on objects. Investigate the turning effects of forces Apply knowledge of forces to explain pressure in liquids and gases	June assessment	How can forces change the shape of an object? Why do deep sea explorers need submarines and why do balloons burst when they get too high?	Friction, drag, stretch, squash, moments, torque, pressure, collisions, density, stress

Year 9 – Science

	Strand and incorporated topic	Key Skills	Assessment	Big Question	Key Terminology
Term 1	Energy Follows on from year 7 and 8 energy. Pupils have learnt about energy costs, resources and transfers as well as power	Identify more complex energy transfers Measure the specific heat capacity of an object Identify the most suitable energy resource by comparing advantages and disadvantages.	December assessment	How can we work out the energy stored in different stores? Why do we need to switch to different energy resources?	Stores, pathways, kinetic, elastic, gravitational, specific heat capacity, efficiency, renewable, non renewable, biomass, geothermal, hydroelectric, waves, tidal, wind, solar, fossil fuels, nuclear
	Organisms (cells and organisation) Builds on Cells and organisation from year 7	Using a microscope- magnification calculation Use <u>working scientifically skills</u> to investigate factors affecting diffusion, osmosis, and enzymes. Calculate % change. Identification of variables Investigating enzymes- variables/ graphs	December assessment	What is the difference between prokaryotic and eukaryotic cells? How do cells obtain what they need? How are living things organised?	Eukaryotic/prokaryotic Stem cells Magnification Mitosis Diffusion, osmosis Enzyme Atria, ventricle Arteries, veins, capillaries Mesophyll Xylem, phloem
	Matter (atomic structure and the periodic table) Builds on Year 8 understanding of elements and compounds and Year 7 understanding of separating mixtures	Understand how scientific advances have led to changes in the structure of the atom and the periodic table as new evidence emerges Draw atoms Use a variety of scientific techniques to separate mixtures.	December Assessment	How have the ideas around the periodic table and the structure of the atom changed over time? How does the structure of atoms affect their chemical properties?	Elements, compounds, mixtures, Periodic Table, atoms, Alkali metals, Halogens, Displacement, Noble Gases, protons, electrons, neutrons

Term 1	<p>Cycles and interactions – bioenergetics</p> <p>Builds on work in year 8 on photosynthesis and respiration</p>	<p>Use working scientifically skills to investigate photosynthesis, aerobic respiration, and fermentation</p>	Dec Assessment	<p>Why is photosynthesis important?</p> <p>How does aerobic respiration differ from anaerobic respiration?</p>	<p>Photosynthesis</p> <p>Aerobic/ anaerobic respiration</p> <p>Lactic acid</p> <p>Oxygen debt (HT)</p> <p>Fermentation</p> <p>Metabolism</p>
Term 2	<p>Matter - Atomic structure – (physics)</p> <p>Builds on work from earlier in the year on atomic structure and year 7/8 work on structure of the atom</p>	<p>Understand what radioactivity is, the difference between contamination and radiation</p>	June Assessment	<p>What is radioactivity?</p>	<p>Alpha, beta, gamma, random, decay, half-life,</p>
	<p>Earth and beyond – chemistry of the atmosphere</p> <p>In year 8 introduced to greenhouse gases and climate change as well as the carbon cycle and early atmosphere.</p>	<p>Explain changes to the atmosphere throughout time.</p> <p>Calculate carbon footprint</p> <p>Balance chemical equations</p>	June Assessment	<p>How has our atmosphere changed?</p> <p>What impact does human activity have on our atmosphere?</p>	<p>Greenhouse, global warming, methane, water vapour, carbon dioxide, pollutants, carbon footprint, peer-reviewed</p>
	<p>Matter – particle model of matter (physics)</p> <p>Builds on work on particles in year 7/8, atoms earlier in year 9 and energy in earlier in year 9</p>	<p>To understand how materials behave affects everything we do – why things float or sink, how granulated sugar can be pumped around a factory as if it were a liquid, why air in tyres is squashable but brake fluid in brakes isn't</p>	June Assessment	<p>What is density ?</p> <p>Why are gasses squashable and liquids are not?</p>	<p>Density, mass, volume, Vaporisation, fusion, temperature , heat, energy</p>

	<p>Lesson on The Yorkshire Wildlife Park -linking to Organisms & Cycles and Interactions strand</p> <p>Lesson on Doncaster Sheffield airport – linking to the forces strand</p> <p>Other Local context lessons written by the teacher – to be delivered to their class!</p> <p>Enrichment lessons Forensic science</p> <p>Enrichment lessons delivered in the context of forensic science - Miscarriages of justice, Fingerprints, microscopes and fibres, blood splatter</p> <p>Develops skills in microscopes, observations and analysis.</p>				
				How is science used to solve crimes?	

Year 10 – GCSE Combined Science (AQA Trilogy)

	Strand and incorporated topic	Key Skills	Assessment	Big Question	Key Terminology
Term 1	Electricity & Magnetism – Electricity Term 1 Follows on from year 7/8 electricity knowledge of series and parallel circuits including charge, current, potential difference and resistance	Investigate and explain the current-voltage characteristics of several components Investigates the resistance of a wire and combinations of resistors. Discuss electricity in the home and describe any safety features.	December assessment	How do your electrical devices work? Why do we connect components in series and parallel? Why do birds like sitting on power cables and why don't they get shocked?	Charge, current, potential difference, resistance, coulombs, amperes, volts, ohms, static, cells, switch, ammeter, voltmeter, resistor, bulb, series, parallel, ohmic, non-ohmic. Variable resistor, thermistor, LDR, diode, LED, fuse, earthing, national grid, transformers.
	Organisms Cell Biology Follows on from work in year 7,8 and 9	Using a microscope-magnification calculation Use working scientifically skills to investigate factors affecting diffusion, osmosis, and enzymes.	December assessment	What is the difference between prokaryotic and eukaryotic cells? How do cells obtain what they need?	Eukaryotic/prokaryotic Stem cells Magnification Mitosis Diffusion, osmosis
	Matter - Structure and Bonding Follows on from understanding of the structure of atoms taught in year 7,8 & 9	Draw dot and cross diagrams for covalent compounds. Model different types of bonding. Investigate properties of compounds and link this to their structure.	December assessment	How does the structure and bonding within substances give rise to different properties?	Covalent, ionic, metallic, solid, liquid, gas, diamond, graphite, graphene, fullerene, alloys, polymers

	Organisms - Infection & Response Builds on knowledge of cells (year 7) - looking at pathogens (cells)	Interpret data and evaluate evidence about new drugs, vaccinations	December assessment	What is a pathogen? How does the body protect itself from pathogens?	Pathogen Bacteria, virus, fungi, protist White blood cell- phagocytosis, antibody, antitoxin vaccine antibiotic placebo double blind trial
Term 2	Reactions - Quantitative Chemistry Builds on understanding of chemical reactions and energy transfers within them	Calculate RFM Balance chemical equations Use moles to determine reactant/product masses (HT only) Calculate concentration Investigate mass changes in various chemical reactions	June Assessment	How are chemical equations used to communicate chemical ideas?	Relative formula mass, conservation, chemical formulae, balance, moles, concentration.
	Chemical Changes Builds on work from KS3 work on acids and alkalis.	Acids and Alkalis Strong and Weak acids	June Assessment	What is the difference between a strong and a weak acid? What is an Indicator	Acid, Alkali, Indicator, Titration, Dissociation,

Term 3	Earth & Beyond - Using Resources At KS3 learnt about the Earth's structure, use of natural resources and how this linked to climate change	Use a variety of tests to check the purity of water (required practical) Complete a life cycle assessment on paper and plastic bags.	June Assessment	How can we use the Earth's resources sustainably? How do we get drinking water?	Water, pure, potable, sewage, filter, sterilisation, microbes, pH, phytomining, bioleaching, LCA, recycling
	Forces Follows on from year 7 and 8 forces knowledge of the effects of forces on the motion and shape of objects	Identify forces as vectors or scalars and contact or non-contact, Calculate resultant forces and describe their effects. Investigate how forces effects the length of a spring Describe motion using calculations and graphs, applying Newton's laws. Use ideas about momentum to explain changes in motion	June assessment	How long is a piece of string (when you hang a weight on it)? Why do/don't objects move? Why do we need speed limits?	Vector, scalar, contact, non-contact, resolving, balanced, equilibrium, resultant force, extension, spring constant, elastic, plastic, limit of proportionality, displacement, acceleration, stationary, stopping distance, thinking distance, braking distance, air resistance, drag, terminal velocity, collisions, explosions, momentum, conservation of momentum.
	Time to revisit content from previous strands + Curriculum Enrichment project+ QLA				

Year 10 – GCSE Biology, Chemistry, Physics (AQA) - Separate Sciences

2022-23 we have one class in year 10 who have opted for GCSE Separate sciences, in their core time the students are studying the Biology and Chemistry and in the option time are studying Physics.

	Strand and incorporated topic (core time 4 hrs a week)	Strand and incorporated topic (Option time 2hrs a week	Key Skills	Assessment	Big Question	Key Terminology
Term 1		Electricity & Magnetism – Electricity Term 1 Follows on from year 7/8 electricity knowledge of series and parallel circuits including charge, current, potential difference and resistance	Investigate and explain the current-voltage characteristics of several components Investigates the resistance of a wire and combinations of resistors. Discuss electricity in the home and describe any safety features.	December assessment	How do your electrical devices work? Why do we connect components in series and parallel? Why do birds like sitting on power cables and why don't they get shocked?	Charge, current, potential difference, resistance, coulombs, amperes, volts, ohms, static, cells, switch, ammeter, voltmeter, resistor, bulb, series, parallel, ohmic, non-ohmic. Variable resistor, thermistor, LDR, diode, LED, fuse, earthing, national grid, transformers.
	Organisms Cell Biology Follows on from work in year 7,8 and 9		Using a microscope-magnification calculation Use working scientifically skills to	December assessment	What is the difference between prokaryotic and eukaryotic cells? How do cells obtain what they need?	Eukaryotic/prokaryotic Stem cells Magnification Mitosis

			investigate factors affecting diffusion, osmosis, and enzymes.			Diffusion, osmosis
	Matter - Structure and Bonding Follows on from understanding of the structure of atoms taught in year 7,8 & 9		Draw dot and cross diagrams for covalent compounds. Model different types of bonding. Investigate properties of compounds and link this to their structure.	December assessment	How does the structure and bonding within substances give rise to different properties?	Covalent, ionic, metallic, solid, liquid, gas, diamond, graphite, graphene, fullerene, alloys, polymers
	Organisms - Infection & Response Builds on knowledge of cells (year 7) - looking at pathogens (cells)		Interpret data and evaluate evidence about new drugs, vaccinations	December assessment	What is a pathogen? How does the body protect itself from pathogens?	Pathogen Bacteria, virus, fungi, protist White blood cell-phagocytosis, antibody, antitoxin vaccine antibiotic placebo double blind trial
Term 2		Forces Follows on from year 7 and 8 forces knowledge of the effects of forces on the motion and shape of objects	Identify forces as vectors or scalars and contact or non-contact, Calculate resultant forces and describe their effects.	June Assessment	How long is a piece of string (when you hang a weight on it)? Why do/don't objects move? Why do we need speed limits?	Vector, scalar, contact, non-contact, resolving, balanced, equilibrium, resultant force, extension, spring constant, elastic, plastic, limit of

			Investigate how forces effects the length of a spring Describe motion using calculations and graphs, applying Newton's laws. Use ideas about momentum to explain changes in motion			proportionality, displacement, acceleration, stationary, stopping distance, thinking distance, braking distance, air resistance, drag, terminal velocity, collisions, explosions, momentum, conservation of momentum.
	Reactions - Quantitative Chemistry Reactions - Quantitative Chemistry Builds on understanding of chemical reactions and energy transfers within them		Calculate RFM Balance chemical equations Use moles to determine reactant/product masses (HT only) Calculate concentration Investigate mass changes in various chemical reactions	December Assessment	How are chemical equations used to communicate chemical ideas?	Relative formula mass, conservation, chemical formulae, balance, moles, concentration.
	Reactions -Chemical Changes Builds on work form KS3 work on acids and alkalis.		Acids and Alkalis Strong and Weak acids	June Assessment	What is the difference between a strong and a weak acid? What is an Indicator	Acid, Alkali, Indicator, Titration, Dissociation,

	Earth & Beyond - Using Resources At KS3 learnt about the Earth's structure, use of natural resources and how this linked to climate change		Use a variety of tests to check the purity of water (required practical) Complete a life cycle assessment on paper and plastic bags.	June Assessment	How can we use the Earth's resources sustainably? How do we get drinking water?	Water, pure, potable, sewage, filter, sterilisation, microbes, pH, phytomining, bioleaching, LCA, recycling
	Reactions : Energy changes (triple content)		Investigate how changing variables affects the temperature changes of a reaction (required practical) recap Batteries and Fuel cells	June Assessment	Are fuel cells a suitable replacement for batteries?	Batteries , Fuel cells
	Reactions : Chemical Analysis		Learn the techniques to be able to identify a range of ions. Gas tests Chromatography(RP)	June Assessment	How would I identify a halogen? A metal ion ?	Cations, Anions, Oxygen, hydrogen, chlorine, carbon dioxide, halogen

Year 11 – GCSE Combined Science (AQA Trilogy)

	Strand and incorporated topic	Key Skills	Assessment	Big Question	Key Terminology
Term 1	ORIGINS - Inheritance, Variation and Evolution	To evaluate information about ethical issues- genetic screening/ engineering	Dec Assessment	Why are organisms unique?	Sexual/ asexual reproduction Mutation Meiosis Genetic disorders Carrier Genome, genotype, and phenotype Selective breeding Extinction classification
	Matter - Organic Chemistry Follows on from year 9 understanding of separating mixtures	Use a general formula to determine the molecular formula of different alkanes. Use a chemical test to identify alkanes from alkenes	Dec Assessment	How to we obtain useful products from crude oil? Why is it important to use crude oil in a sustainable way? (Links to Using Resources)	Crude oil, hydrocarbons, fractional distillation, cracking, alkanes, alkenes, combustion

	<p>Organisms- Homeostasis</p> <p>Builds on knowledge from previous unit. Looks at endocrine and nervous system</p>	<p>Investigate reaction time. Compare nervous and hormonal control</p>	Dec Assessment	<p>What is homeostasis?</p> <p>How are conditions controlled?</p>	<p>Stimulus, receptor, effector, response</p> <p>Neurone</p> <p>Synapse</p> <p>Reflex arc</p> <p>Insulin, glucagon (HT)</p> <p>FSH, LH, Oestrogen and progesterone</p> <p>Puberty, menstrual cycle</p> <p>Contraceptive</p>
	<p>Electricity & Magnetism – Magnets Term 1</p> <p>Follows on from year 8 magnets and electromagnetism. Knowledge of magnetic field lines and the construction of electro magnets</p>	<p>Investigate permanent and induced magnets</p> <p>Describe the motor effect and explain how this effect is used in electrical motors</p>	Dec Assessment Paper 2's	<p>Why do paper clips stick to magnets but drinks cans not?</p> <p>Why do motors move?</p>	<p>Permanent magnet, induced magnet, attract, repel, solenoid, electromagnet, motor effect, coil, magnetic flux density, split ring commutator.</p>
	<p>Reactions - Rates of Reaction</p> <p>Builds on understanding of types of chemical reactions and factors that can affect them</p>	<p>Calculate rate of reaction from a graph using a tangent (HT only)</p> <p>Measure the rate of reaction using a variety of scientific methods such as the disappearing cross</p> <p>Describe different factors that affect the rate of reaction.</p> <p>Explain Le Chatelier's Principle (HT only)</p>	Dec Assessment Paper 2's	<p>How can we speed up chemical reactions?</p>	<p>Rates, independent, dependent, control, tangents, pressure, temperature, concentration, surface area: volume ratio, catalyst, equilibrium, Le Chatelier's</p>

Term 2	Reactions - Chemical Analysis Follows KS3 understanding of identifying chemicals (such as acids/bases) and chromatography as a separation technique.	Separate out a mixture using chromatography (required practical) Calculate Rf values. Identify gases using gas tests.	March Mock All 6 Papers	How can we identify unknown chemicals?	Chromatography, pure, formulation, mixture, mobile phase, stationary phase, Rf value, lime water, litmus paper
	Waves – Waves This follows on from Waves in year 8. pupils learnt about the EM spectrum, seismic waves and the differences between transverse and longitudinal waves.	Measure the wave speed in water waves and waves on a string. Investigate how light is reflected and refracted.	March Mock All 6 Papers	How do we use waves to communicate? How can waves be dangerous?	Transverse and longitudinal, radio waves, microwaves, infrared, visible, ultra violet, x rays, gamma rays, ionising.
Term 3	Time to revisit Strands Taught Previously – Revision for GCSE Exams				

