

Science Curriculum Map

We have approached the teaching of KS3 and KS4 in a spiral curriculum method. Students experience the 3 Sciences as building upon current knowledge throughout the 5 years. Key concept content for GCSE is repeated at points through year 10 and 11 to allow pupils to grasp the key ideas of science fully.

KS2 prior learning	Chemistry
	Biology
	Physics

Year	What do students learn?	Why?	Tier 3 keywords	Threshold concepts	Literacy	Assessment
7	Block 1 <ul style="list-style-type: none"> Chemistry- Particle model Chemistry- Pure and impure substances 	Block 1 These topics underpin all of the sciences; matter is made from particles and organisms are made from cells.	Model, particle, diffusion, gas pressure, vibration, solution, solute, solvent, soluble, insoluble, saturated solution filtration, distillation, chromatography, chromatogram membrane, cytoplasm, nucleus, chloroplast, vacuole, cell wall,	Know that matter is made of particles. Differences in the structure of animal and plant cells.	Reading Information about different diseases. Writing	Baseline test during first weeks at HWA to assess

<ul style="list-style-type: none"> • Biology - Cells and organisation <p>Block 2</p> <ul style="list-style-type: none"> • Chemistry - Atoms and elements and the periodic table • Physics – Forces • Biology - Nutrition and digestion <p>Disability, neurodiversity is covered in the nutrition topic.</p> <p>Block 3</p> <ul style="list-style-type: none"> • Physics - Energy changes and transfers • Biology – Microbes and disease • Biology – Reproduction <p>Protected characteristics: Sex, Race and equality. Maternity and sexual reproduction are taught in the reproduction topic. Fertility is also covered. Aspects of disability are covered in the microbes topic.</p> <p>Block 4</p> <ul style="list-style-type: none"> • Chemistry/Physics - Physical changes • Chemistry -Chemical reactions – acids and alkalis • Physics - Magnetism • Physics – Electrical circuits 	<p>The pure and impure topic starts to build on practical based skills which are essential for all practicals e.g. filtration as well as the practical equipment names and health and safety precautions.</p> <p>Block 2</p> <p>Atoms topic builds on particle topic with further detail. Students are introduced to the periodic table early in year 7 so that they have practise in identifying elements and deepening their understanding.</p> <p>Forces topic is essential in Physics as it helps pupils to explain how the same forces that hold the universe together also hold atoms together and help us to move around</p> <p>Digestion and nutrition build on learning from KS2 and is very applicable to their everyday life. Their understanding ranges from links to PSHE (what makes a healthy diet), P.E. (why is energy needed where it comes from) so students can explain what happens to food after eat after we eat it.</p> <p>Block 3</p> <p>We are learning this so students can explain simple energy transfers which builds from knowledge from KS2 and into equations for KS4.</p> <p>Both Biology topics have significant relevance to students in terms of wellbeing when growing older. Students will be having inoculations in year 8&9 and important that they understand the significance of these. The reproduction topic explains the science behind reproduction and how human babies are made; which will link to PSHE</p> <p>Block 4</p> <p>Students can explain the difference between physical changes and chemical reactions so they can identify these in their everyday lives and in the various practicals during their science curriculum.</p>	<p>membrane, tissue, variable, sample size, evaluate, magnification</p> <p>element, compound, atom, molecule, symbol,</p> <p>drag, upthrust, weight, mass, density, Newton, contact force, non-contact force</p> <p>intestine, villus, liver, carbohydrates, protein, enzyme, absorption, deficiency disease</p> <p>Conduction, convection, radiation, insulator, conductor,</p> <p>bacteria, viruses, fungi, measles, chickenpox, infection, pathogen vaccination, inoculation and immunisation, antibiotic, anti-microbial, ovary, testis, oviduct, uterus, menstruation, ovulation, fertilisation, placenta, sperm, gestation, hereditary and inherited, baby and foetus, puberty and adolescence, fuse</p> <p>Physical, chemical, state, mass, diffusion, Brownian motion</p>	<p>Difference between atoms, elements, compounds & mixtures.</p> <p>Identify when forces are balanced and unbalanced.</p> <p>Order of digestive organs.</p> <p>Difference between conduction, convection and radiation</p> <p>Difference between pathogens and bacteria, viruses and fungi.</p> <p>Identify the difference between physical and chemical reactions.</p> <p>Know the difference between acids, alkalis and neutral substances in terms of pH number.</p> <p>Know when magnets are attracted and repelled, even when magnets are turned.</p>	<p>Using key terms, descriptions of states of matter</p> <p>Making a model of a cell and evaluation report on friction investigation, spring investigation etc. long answer assessment explaining heat transfers</p> <p>Write a story/ create a storyboard about the journey of the sperm cell to the egg cell</p> <p>Make a model of sperm cell or an egg cell and evaluate the model</p> <p>Write a full investigation into the resistance of a wire.</p> <p>Oracy</p> <p>Using key terms -writing methods for separating substances e.g. rock salt & sea water using discussion Class discussion on forces misconceptions</p>	<p>current knowledge.</p> <p>'Badger' assessed tasks</p> <p>Term 3 DOYA</p> <p>Term 6 DOYA</p>
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Year	What do students learn?	Why?	Tier 3 keywords	Threshold concepts	Literacy	Assessment
8	<p>Block 1</p> <ul style="list-style-type: none"> Chemistry: chemical reactions Physics: forces and motion <p>Block 2</p> <ul style="list-style-type: none"> Biology: cellular respiration and gas exchange Physics: waves <p>Race and equality can be covered in the waves topic re early work on lenses.</p> <p>Block 3</p> <ul style="list-style-type: none"> Biology: evolution Chemistry: energy in chemical reactions Chemistry: metals and reactivity <p>Religion or belief is covered in evolution.</p> <p>Block 4</p> <ul style="list-style-type: none"> Biology: photosynthesis Biology: relationships in an ecosystem Chemistry: earth and atmosphere 	<p>Block 1</p> <p>Using knowledge from year 7; students will further develop their understanding of reactions to include word and symbol equations which is a fundamental skill.</p> <p>Using knowledge from year 7; students will further understand forces to explain how to predict the future motion of an object using a scientific law. The laws are also a key part of Physics GCSE.</p> <p>Block 2</p> <p>Linking knowledge on cells and organisms students will learn fundamental biology equations for photosynthesis and respiration; so they can explain how plants and animals get the energy they need for life.</p> <p>Waves is a large topic at GCSE which is broken down into learning so that students can describe how sound and light transfer information for sight and sound.</p> <p>Block 3</p> <p>To understand how variation can lead to new species or extinction.</p> <p>To describe that some reactions take in energy and some reactions release energy</p>	<p>Elements, compounds reactant, product, word equation</p> <p>Speed, distance, time, metres, miles, kilometres, seconds, m/s, km/h, mph, resultant, acceleration</p> <p>lung, trachea, bronchus, ribcage, red blood cell, haemoglobin, artery, vein, breathing, respire, inhale, exhale</p> <p>image, reflection, waves, pitch, frequency, amplitude, wavelength, loudness</p> <p>inheritance, species, variation, environmental characteristics, genetic characteristics, survival, adaptation. Heat, thermal, exothermic, endothermic, bonds, activation energy. salt, reaction, product</p> <p>palisade cell, chlorophyll, biomass, glucose and sugar, photosynthesis, biomass, community, habitat, pyramid</p>	<p>Difference between reactants and products.</p> <p>Mass and weight are not the same.</p> <p>Recall the equations for respiration. Respiration is not breathing.</p> <p>Know how sound waves are formed.</p> <p>Understand how evolution occurs.</p> <p>Energy is not used up in reactions.</p>	<p>Reading</p> <p>About how some animals and plants have become endangered or extinct. Different energy suppliers information to make a judgement.</p> <p>Writing</p> <p>Extended response analysis and evaluation of rusting experiment. Core practical - Investigate how length of wing of a helicopter affects the time of flight A conclusion explaining results from an investigation into the angles of refraction. onclusion of investigation into exo and endothermic reactions Written method for making copper sulfate crystals. Written piece about the advantages and</p>	<p>Term 3 DOYA</p> <p>Term 6 DOYA</p>

		<p>We are learning this so we can describe where the metals we use in everyday life come from and how we process them.</p> <p>Block 4</p> <p>We are learning this so that we can explain why plants are so important for the survival of all life on Earth.</p> <p>To explain how organisms depend on each other in an ecosystem.</p> <p>So they can describe the atmosphere, and what we can do to keep it healthy for humans in the future.</p>	<p>of numbers, predator, carnivore, environment, ecosystem, environmental conditions, quadrat sampling, transect, population sizes, reliable data, vegetation cover, acid rain, catalytic converter, air and water quality, global warming, magma, core, crust, lava, turbine, generator, national grid, fuel, hydroelectricity, geothermal, ozone, global warming, carbon cycle, decomposer, respiration, photosynthesis</p>	<p>The equation for photosynthesis.</p> <p>How to interpret food webs.</p> <p>How global warming is caused.</p>	<p>disadvantages of pesticides.</p> <p>Oracy</p> <p>Explanation of metal extraction linked to reactivity series.</p> <p>How light affects the rate of photosynthesis investigation</p> <p>Letter to your MP campaigning for/against a local power station.</p> <p>Comparing different types of ways to generate electricity.</p>	
Year	What do students learn?	Why?	Tier 3 keywords	Threshold concepts	Literacy	Assessment
9	<p>Terms 1 and 2: Biology</p> <ul style="list-style-type: none"> Biology key concepts: microscopes, cells, enzymes and transport Biology processes: mitosis, meiosis, inheritance, variation, nervous system Biology Natural selection; how organisms are classified and how humans can alter organisms for their benefit <p>Protected characteristics: Sex, Race and equality, disability, religion and belief; what chromosomes mean with sex but not gender, how mutations occur/ differences between other people, natural selection/ evolution/ creationism, ethics with genetic mutations</p>	<p>Terms 1 and 2: Biology</p> <p>Key concepts in Biology which are on both papers:</p> <ul style="list-style-type: none"> Cells are building blocks of life (links to KS3 cells) further parts of the cell are learnt and links to processes such as respiration Enzymes allow important processes to happen inside organisms (e.g. digestion) links to KS2 & 3 but further understanding of how enzymes function and their importance included Transport allows pupils to understand how substances can move between cells. <p>Processes allow students to understand why we are all different:</p> <ul style="list-style-type: none"> Processes of growth in animals and plants which links to cells taught earlier Ideas about how we inherit variation and how mutation leads to more dramatic types of variation. Links to KS3 (reproduction & evolution) but pupils now learn about how sexual reproduction leads to variation, further detail about DNA structure & its importance 	<p>Lens, magnification, resolution, aerobic respiration, chlorophyll, eukaryotic, mitochondrion, ribosome, acrosome, ciliated epithelial cell, cilium, diploid, enzyme, epithelial cell, gamete, haploid, flagellum, plasmid, prokaryotic, catalyst, substrate, synthesis, active site, denatured, specific, optimum, active transport, diffusion, osmosis</p> <p>Anaphase, cytokinesis, interphase, metaphase, prophase, telophase, spindle fibres, differentiation, elongation, meristem, stem cell, axon, dendrite, dendron, myelin sheath, neurotransmission, receptor cell, stimulus, neurotransmitter, reflex arc, synapse, chromosome, genome, meiosis, mitosis, zygote, base (DNA), complementary base pair, double helix, dominant, recessive, heterozygous, homozygous, Punnett square, mutation,</p> <p>Binomial system, ancestor, classification, domain, genus, kingdom, species, artificial selection, breed,</p>	<p>Recall the differences between eukaryotic and prokaryotic cells.</p> <p>Enzymes speed up reactions but are not used up.</p> <p>Differences between diffusion, osmosis and active transport.</p> <p>Most cells contain 23 pairs of chromosomes, gametes contain 23 chromosomes.</p> <p>Difference between DNA, chromosomes, genes and alleles.</p>	<p>Reading</p> <p>Different view-points on the use of GM foods. Text about the discovery of the structure of the atom over time.</p> <p>Writing</p> <p>Methods/ conclusion/ evaluation for the core practicals: osmosis in potato, chromatography, distillation, car acceleration on a ramp,</p> <p>Oracy</p> <p>Describing the roles of the structure of a cell.</p> <p>Describing how a stimulus is detected in the body through a reflex arc.</p>	<p>End of topic assessments from Edexcel which give an estimated grade.</p> <p>Y9 PPE</p> <p>Term 6</p>

<p>Terms 3 and 4: Chemistry</p> <ul style="list-style-type: none"> Chemistry: states of matter, filtration, crystallisation, chromatography, distillation, drinking water Chemistry key concepts: atoms, elements, bonding, metals Protected characteristics: Age and disability; development of atom and Periodic table over time, ages of scientists and Rutherford being student of Thompson. Dalton being colourblind. Chemistry: acids and alkalis, neutralisation, acid reactions <p>Terms 5 and 6: Physics</p> <ul style="list-style-type: none"> Physics: vector and scalar measurement, speed, acceleration, velocity, forces, Newton's laws, momentum, stopping distances Physics: energy stores and transfers, efficiency, non-renewable and renewable resources Protected characteristics: Disability; use of appliances specifically used by those with additional needs Physics: Waves Protected characteristics: Race and Religion and belief and Disability; Alhazen scientist who 	<ul style="list-style-type: none"> Understanding how the body responds to environmental stimulus <p>Natural selection; builds on ideas on cells and types of organisms. DNA structure key ideas are explored further; how humans manipulate this knowledge to breed certain animals and use GM.</p> <p>Terms 3 and 4: Chemistry</p> <p>There are several core/ required practicals included to increase pupil engagement (biology topics are light on practical elements). Real life application for how drinking water is purified.</p> <p><i>Links to KS3 content: particle model, pure & impure, chemical and physical reactions; now applying this to different investigations and applications</i></p> <p>Key concepts in Chemistry which are on both papers:</p> <ul style="list-style-type: none"> Atoms make up all substances (links to KS3; atoms & periodic table; now looking in detail at the inside of atom) How model of the atom has changed over time with scientists involved (also links to Physics later in the course) Use of periodic table to work out atom structure is fundamental (KS3; periodic table in more depth including how to use the data on the table) Bonding completes understanding from KS3 about differences between atoms, elements, mixtures and compounds <p>Terms 5 and 6: Physics</p> <p>Fundamental concepts in Physics:</p> <ul style="list-style-type: none"> Introduction of several equations to learn for exams earlier (KS3; forces types helps 	<p>genetic engineering, genetically modified organism, yield, diabetes, ligase, plasmid, recombinant DNA, restriction enzyme, sticky end</p> <p>Particle, crystallisation, filtrate, insoluble, residue, solute, solvent, chromatography, stationary phase, mobile phase, chromatogram, Distillation, still, aquifer, chlorination, desalination, precipitate, sedimentation</p> <p>Atom, compound, element, proton, neutron, electron, shell, nucleus, subatomic particles, atomic number, mass number, isotopes, relative atomic mass, inert, period, group, electronic configuration, anion, cation, electrostatic forces, ionic bond, covalent bond, lattice structure, molecule, intermolecular forces, polymer, delocalised electron, fullerene, graphite, graphene, nanotubes, lubricant, lattice, malleable</p> <p>Acceleration, displacement, magnitude, momentum, scalar quantity, vector quantity, velocity, gradient, deceleration, centripetal force (higher only), mass, weight, gravitational field strength, thinking distance, braking distance, stopping distance, crumple zone,</p> <p>Chemical energy, elastic potential energy, gravitational potential energy, joules, kinetic energy nuclear energy, Sankey diagram, thermal energy, dissipated, efficiency, emit, infrared radiation, thermal conductor, thermal insulator, climate change</p> <p>Amplitude, electromagnetic waves, frequency, hertz, longitudinal wave, medium, transverse wave, wavelength,</p>	<p>Recall the order of a reflex arc.</p> <p>Reasons why artificial selection is important.</p> <p>Reasons for separating substances.</p> <p>Structure of the atom (Bohr model).</p> <p>Difference between acceleration and velocity.</p>		
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	developed ideas and laws about light, lenses, pin-hole cameras (race/religion), Richard Mankin (disability)	<p>understanding as now applying force diagrams to different scenarios, developing understanding of how forces can be calculated)</p> <ul style="list-style-type: none"> Key scientist, Newton, his discoveries Stopping distances related to everyday life in a car and future tests for driving licence Links to everyday life with choosing appliances based on efficiency Links to everyday life with electricity production & links to global warming & atmosphere (also in Chemistry course) Further calculations and required practical <p><i>Links to KS3; energy changes and electricity; now applying knowledge of energy to its production and evaluating these ways</i></p>	refraction, interface, normal, infrared, ultraviolet, vacuum, visible light, angle of incidence, angle of refraction, incident ray,	Energy is not lost from a situation; it transfers in its form		
Year	What do students learn?	Why?	Tier 3 keywords	Threshold concepts	Literacy	Assessment
10	<p>Term 1 Chemistry: Chemical changes</p> <p>Physics: vector and scalar measurement, speed, acceleration, velocity, forces, Newton's laws, momentum, stopping distances</p> <p>Protected Characteristic: Disability; cars/vehicles that are designed to support those with disability, the safety features needed etc.</p>	<p>Focus on missed content (practical based topics) due to lock-down.</p> <p>Term 1</p> <ul style="list-style-type: none"> Commonly used chemicals in science experiments Formation of word and symbol equations from information provided Core practical applies knowledge of whole topic <p><i>Links to KS3; acids & alkalis, metals & reactivity; now looking at how neutralisation can be investigated accurately, what are the features of acids and alkalis</i></p> <p>Fundamental concepts in Physics:</p> <ul style="list-style-type: none"> Introduction of several equations to learn for exams earlier (KS3; forces types helps understanding as now applying force diagrams to different scenarios, developing understanding of how forces can be calculated) 	<p>Aqueous solution, concentrated, dilute, dissociate, pH meter, burette, end-point, crystallisation, titration, pipette, effervescence, half equation, ionic equation, oxidation, reduction, spectator ions,</p> <p>Acceleration, displacement, magnitude, momentum, scalar quantity, vector quantity, velocity, gradient, deceleration, centripetal force (higher only), mass, weight, gravitational field strength, thinking distance, braking distance, stopping distance, crumple zone,</p>	<p>Recall that acid + base -> salt + water.</p> <p>Newton's 3 laws.</p>	<p>Reading</p> <p>Articles on various communicable and non-communicable diseases. Articles on nuclear/ radioactive disasters. Article on ecosystem problems; deforestation, eutrophication, overfishing.</p> <p>Writing</p> <p>Explaining how vaccines lead to immunity. Method/ results/ conclusion for making a soluble salt, different electrolysis practicals. Description of the hormones involved in the menstrual cycle.</p>	<p>End of topic assessments from Edexcel which give an estimated grade.</p> <p>Term 6 Y10 PPE</p>

	<p>Term 2</p> <p>Physics: energy stores and transfers, efficiency, non-renewable and renewable resources</p> <p>Term 3</p> <p>Biology: Health</p> <p>Chemistry: Metals</p> <p>Protected characteristics: Race and equality and religion or belief; Equilibrium with Haber and involvement with WW1 Chemical warfare</p>	<ul style="list-style-type: none"> • Key scientist, Newton, his discoveries • Stopping distances related to everyday life in a car and future tests for driving licence <p>Term 2</p> <ul style="list-style-type: none"> • Links to everyday life with choosing appliances based on efficiency • Links to everyday life with electricity production & links to global warming & atmosphere (also in Chemistry course) • Further calculations and required practical <p><i>Links to KS3; energy changes and electricity; now applying knowledge of energy to its production and evaluating these ways</i></p> <p>Term 2</p> <p>Terms 3</p> <p>Health topic relates well to current pandemic and therefore keep engagement of pupils towards middle of the school year. This topic builds on prior knowledge of cells and natural selection and enables pupils to apply scientific knowledge to their everyday/ common knowledge.</p> <p>Topics finish off the content for paper 1 and link to previous Chemistry topics well (atoms, periodic table). More difficult content in the extracting metals topic (e.g. electrolysis) which needs to be embedded over time.</p> <p>Term 4</p> <p>These two physics topics finish the content for paper 1 and relate well to each other. The energy topic extends knowledge about the EM spectrum. These are the first parts of paper 2 content.</p>	<p>Chemical energy, elastic potential energy, gravitational potential energy, joules, kinetic energy nuclear energy, Sankey diagram, thermal energy, dissipated, efficiency, emit, infrared radiation, thermal conductor, thermal insulator, climate change</p> <p>Communicable disease, correlation, immune system, non-communicable disease, pathogen, cirrhosis, deficiency disease, cardiovascular disease, stent, stroke, AIDS, cholera, diarrhoea, haemorrhagic fever, host, HIV, malaria, protist, tuberculosis, ulcer, epidemic, vector, chlamydia, lysozyme, physical barrier, chemical barrier, antibody, antigen, immunisation, lymphocyte, memory lymphocyte, clinical trial, colony, penicillin, pre-clinical testing, double-blind trial</p> <p>Electrolysis, anode, cathode, cation, electrode, electrolysis, electrolyte, inert, redox reaction, bioleaching, leachate, ore, phytoextraction, corrosion, rusting, tarnish, closed system, dynamic equilibrium, endothermic, exothermic, open system, reversible reaction</p> <p>Amplitude, electromagnetic waves, frequency, hertz, longitudinal wave,</p>	<p>Energy is not lost.</p> <p>Difference between communicable diseases and non-communicable diseases.</p> <p>Atoms can form ions by losing or gaining electrons.</p> <p>Differences between alpha, beta and gamma radiation.</p> <p>Recall the EM spectrum in order (either high to low frequency or vice versa).</p> <p>Linking outer electron number to group number.</p> <p>Equation for photosynthesis and respiration in plants.</p> <p>Homeostasis.</p>	<p>Oracy</p> <p>Recalling various everyday uses of the EM spectrum. Suggesting appropriate methods of contraception and the success of these.</p>	
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	<p>Term 4</p> <p>Physics: Waves</p> <p>Physics: radioactivity and the EM spectrum Protected characteristics: Disability; Thomas Edison's sensory impairment</p> <p>Chemistry: groups of the periodic table and extracting metals</p> <p>Terms 5</p> <p>Biology: Plants and hormones and menstrual cycle and diabetes, Protected characteristics: Age, Sex, Gender reassignment, pregnancy and maternity; learning menstrual cycle for biological females, differences with gender reassigned people, learning about IVF use</p> <p>Term 6</p>	<p>Chemistry groups topic consolidates knowledge about atoms from year 9 and provides explanation as to why some elements are more reactive than others. This enables pupils to move from observing reactions occur to then be able to explain why these are occurring.</p> <p>Term 5</p> <p>First paper 2 topics for biology; chosen for their application to real life and the building up of knowledge from KS3 & yr10 (cells, photosynthesis; now applying to plant adaptations and structure) to understand plants functions in depth. Understanding how hormones travel in humans compared to transportation in plants.</p> <p>Term 6</p> <p>Students struggle with these calculations so placed near end of yr10 to build on chemistry knowledge of atoms, periodic table and equations from Physics, so students are more able and confident when approaching Chemistry calculations.</p>	<p>medium, transverse wave, wavelength, refraction, interface, normal, infrared, ultraviolet, vacuum, visible light, angle of incidence, angle of refraction, incident ray,</p> <p>Gamma rays, microwaves, radio waves, x-rays, oscillations, fluorescence, radiotherapy. Alpha particle, nucleon, absorption spectrum, emission spectrum, ionising radiation, background radiation, cosmic rays, dose, Geiger-Muller tube, beta particle, radioactive decay, gamma ray, penetrate, positron, unstable, nuclear equation, becquerel, half-life, contamination, irradiation</p> <p>Cellulose, gas exchange, guard cell, lipid, palisade cell, protist, starch, sucrose, stoma, nitrate, companion cell, lignin, potometer, sieve tube, translocation, transpiration Adrenal gland, endocrine gland, pituitary gland, target organ, thyroid gland, adrenalin, fight-or-flight response, glycogen, negative feedback, thyroxine, oestrogen, progesterone, ART, corpus luteum, FSH, IVF, LH, homeostasis</p> <p>Empirical formula, molecular formula, Avogadro constant, mole</p>	<p>How to calculate relative molecular mass from atomic masses on the periodic table,</p>		
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Year	What do students learn?	Why?	Tier 3 keywords	Threshold concepts	Literacy	Assessment
11	<p>Chemistry: Quantitative analysis</p> <p>Chemistry: key concepts revision, groups of periodic table, rates of reaction, endo and exothermic, fuels (and earth science)</p> <p>Protected characteristics: Religion or belief; heliocentric belief and creationism</p> <p>Biology: Ecosystems</p> <p>Term 2</p> <p>Biology: , Plants, exchange in animals</p> <p>Protected characteristics: Disability; chronic asthma/ COPD etc.</p> <p>Term 3</p>	<p>Term 1</p> <p>Chemistry groups topic consolidates knowledge about atoms from year 9 and provides explanation as to why some elements are more reactive than others. This enables pupils to move from observing reactions occur to then be able to explain why these are occurring.</p> <p>Build on gaps identified in yr10 assessment. Rates of reaction topic is highly engaging and includes a couple of required practicals which pupils need to be very familiar with. The fuels and earth science topic was a key weakness in 2018 exams possibly due to it being taught at the end of yr11. Therefore it has been moved to a more prominent place. Earth science taught as a summary as taught during lock-down when yr10s were attending school.</p> <p>Ecosystems</p> <p>Term 2</p> <p>First paper 2 topics for biology; chosen for their application to real life and the building up of knowledge from KS3 & yr10 (cells, photosynthesis; now applying to plant adaptations and structure) to understand plants functions in depth.</p> <p>Build on weaknesses from yr10 exam. Exchange in animals is also covered in PE GCSE and knowledge of the plant topic in yr10 builds to understand exchange in animals. Also opportunity to recap transport in yr9</p> <p>Term 3</p>	<p>Nobel gases, Alkali metals, Halogens, ions.</p> <p>Activation energy, endothermic, exothermic, active site, catalyst, denatured, reaction profile.</p> <p>Crude oil, feedstock, finite resource, hydrocarbon, fractionating column, ignite, viscosity, alkane, general formula, homologous series, carbon monoxide, complete combustion, incomplete combustion, haemoglobin, acid rain, weathering, alkene, cracking, saturated, unsaturated.</p> <p>Causal link, climate change, global warming, greenhouse effect, infrared, resolution.</p> <p>Empirical formula, molecular formula, Avogadro constant, mole</p> <p>Cellulose, gas exchange, guard cell, lipid, palisade cell, protist, starch, sucrose, stoma, nitrate, companion cell, lignin, potometer, sieve tube, translocation, transpiration</p> <p>Aerobic respiration, alveolus, erythrocyte, plasma, platelet, valve, aorta, atrium, deoxygenated blood, oxygenated blood, pulmonary artery, pulmonary vein, septum, stroke volume, tendon, vena cava, ventricle, lactic acid.</p> <p>Ampere, potential difference, voltage, charge, coulomb, ohm, resistance,</p>	<p>Outer electron number and group number/ reactivity.</p> <p>Recall the definition of activation energy.</p> <p>What the boiling point of a substance means.</p> <p>How to calculate relative formula mass, moles.</p> <p>The structure of the heart.</p>	<p>Reading</p> <p>Article on heart disease in the UK.</p> <p>Writing</p> <p>Extended writing on the use of fractional distillation.</p> <p>Extended writing on the journey of blood through the body and heart.</p> <p>Oracy</p> <p>Explaining how to set up various circuits to test voltage, current, resistance.</p> <p>Explaining how to correctly wire a plug and describing the functions of the various components.</p>	<p>End of topic assessments from Edexcel which give an estimated grade.</p> <p>Term 2 Y11 PPE Term 2</p> <p>Term 3 Y11 PPE Term 4</p>

	<p>Physics: electricity, forces, magnetism, EM induction, particle model</p> <p>Protected characteristics: Race and religion; Michael Faraday and his religious beliefs</p>	<p>These physics topics relate very well to each other as they build from electricity, forces, magnets and then how these will be used in electromagnets.</p>	<p>direct proportion, diode, LDR, LED, thermistor, power, watt, a.c. , d.c. , hertz, national grid, circuit breaker, earth wire, fuse, live wire, neutral wire. Induced magnet, permanent magnet, electromagnet, solenoid, Fleming's left-hand rule, magnetic flux density, motor effect, tesla. Electromagnetic induction, transformer, step-down transformer, transmission lines,</p>	<p>Difference between voltage/ potential difference and current</p> <p>Hooke's law practical and measurements</p>		
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