



Combined Science

Year 9,10 & 11 Subject Learning Scheme 2017-2018



Year 9	Autumn Term 1a (7 weeks)	Autumn Term 1b (8 weeks)	Spring Term 2a (6 weeks)	Spring Term 2b (4 weeks 2 days)	Summer Term 3a (6 weeks)	Summer Term 3b (7 weeks)
<p>Key Learning</p> <ul style="list-style-type: none"> • knowledge • skills • experiences 	<p>Classes will be taught by two teachers, each teacher teaching two lessons per week.</p> <p><u>Biology</u></p> <p>Cells 1</p> <p>Cell Structure, microscopy and magnification. Diffusion and exchange surfaces</p> <p><u>Physics</u></p> <p>Energy</p> <p>Energy changes in a system, and the ways energy is stored before and after such changes</p> <p>Conservation and dissipation of energy</p>	<p>Classes will be taught by two teachers, each teacher teaching two lessons per week.</p> <p><u>Chemistry</u></p> <p>Atomic structure</p> <p>Atoms Elements and compounds. Conservation of mass and the quantitative interpretation of chemical equations</p> <p>Balancing equations</p> <p>Separating Mixtures</p>	<p>Classes will be taught by two teachers, each teacher teaching two lessons per week.</p> <p><u>Biology</u></p> <p>The Human Digestive system and the role of enzymes</p> <p>Students will recap the main parts of the digestive system, and study the roles of specific enzymes to convert food into soluble substances</p> <p><u>Chemistry</u></p> <p>Periodic Table.</p> <p>Development of the periodic table and the characteristic properties of groups 0, 1 and 7</p> <p>Bonding, structure and the properties of matter</p>	<p>Classes will be taught by two teachers, each teacher teaching two lessons per week.</p> <p><u>Chemistry</u></p> <p>Bonding, structure and the properties of matter</p> <p>Chemical bonds, ionic, covalent and metallic bonding. Properties of these compounds and relating the properties to the bonding.</p> <p>Polymers Metals and Alloys Fullerenes and Nanoscience</p>	<p>Classes will be taught by two teachers, each teacher teaching two lessons per week.</p> <p><u>Chemistry</u></p> <p>Quantitative Science</p> <p>Formula Mass</p> <p>Calculating moles</p> <p>Use of amount of substance in relation to masses of pure substances</p> <p><u>Physics</u></p> <p>Particle model of matter</p> <p>Changes of state and the particle model</p>	<p>Classes will be taught by two teachers, each teacher teaching two lessons per week.</p> <p><u>Physics</u></p> <p>Atomic Structure</p> <p>Atomic Structure, isotopes, Radioactive Decay, nuclear equations and radioactive decay</p> <p><u>Biology</u></p> <p>Plants and Transport</p> <p>Structure of the leaf. Plant tissues: xylem and phloem. Transpiration and translocation</p> <p>Health and Disease 1</p> <p>Non-communicable diseases, risk factors and Cancer.</p>

	National and global energy resources	<p>Physics</p> <p>Electrical Circuits</p> <p>Current, potential difference and resistance</p> <p>Series and parallel circuits</p>	Chemical bonds, ionic, covalent and metallic bonding. Properties of these compounds and relating the properties to the bonding.	<p>Biology</p> <p>Breathing</p> <p>Students will learn about the structure of the lungs and ventilation.</p> <p>Circulation</p> <p>Blood cells and vessels, the structure and function of the heart and ways to treat or prevent heart disease</p>	Internal energy and energy transfers	Particle model and pressure
SMSC and British Values.	<p>What is the definition of life?</p> <p>The importance of using renewable energy resources.</p> <p>Insulating your home.</p>	How science works history/modelling the structure of the atom	How science works: the history of the periodic table	<p>Organ Transplants</p> <p>Coronary heart disease, causes and effects.</p>	Students will calculate atom economy of industrial reactions and relate to environmental chemistry.	<p>Impact of Radioactivity on human Health.</p> <p>Disposal of Radioactive waste.</p>
Key Homework	<p>Biology Homework Are viruses living things?</p> <p>Biology Homework: Cells</p> <p>Biology Homework: Diffusion</p>	<p>Chemistry Homework: Research 3 elements</p> <p>Chemistry Homework: GCSE Question:</p>	<p>Biology Homework: Data analysis: Amylase</p> <p>Chemistry Homework: Analysis: melting points of group 7 elements.</p> <p>Chemistry Homework: Summary Exercise:</p>	<p>Chemistry Homework Uses of Alloys</p> <p>Chemistry Homework GCSE Question: Fullerenes and Graphene</p>	<p>Chemistry Homework Practise formula mass calculations and % mass</p> <p>Physics Homework Density calculations.</p>	<p>Physics Homework Atomic model timeline</p> <p>Physics Homework Uranium breakdown</p> <p>Physics Homework: Half -life.</p>

	<p>Physics Homework Sankey diagrams</p> <p>Physics Homework Insulation methods in your home.</p> <p>Physics Homework Comparing U-Values.</p>	<p>Interpreting a chemical reaction</p> <p>Chemistry Homework: Balancing chemical equations</p> <p>Physics Homework: Learning: Circuit symbols</p> <p>Physics Homework: Application: Ohm's Law</p>	<p>Groups of the periodic table</p> <p>Chemistry Homework: GCSE question: ionic bonding.</p>	<p>Biology Homework: Breathing and lung capacity</p> <p>Biology Homework: Blood cells</p> <p>Biology Homework: Heart Structure</p>	<p>Physics Homework: Cooling Curve Analysis</p>	<p>Biology Homework Plant cells</p> <p>Biology Homework 6 Mark question leaf on structure</p> <p>Biology Homework: plant transport</p>
<p>Key Assessment incl. dates</p>	<p><u>Biology:</u></p> <p>End of topic test: Cells</p> <p>Required Practical: Using a light microscope to observe cells</p> <p><u>Physics:</u></p> <p>Progress Test: Energy Assessment 1</p> <p>Progress Test: Energy Assessment 2</p>	<p><u>Chemistry:</u></p> <p>Progress test: Atomic structure 1</p> <p>Required Practical: Distillation</p> <p>Required Practical: Chromatography</p> <p><u>Physics:</u></p> <p>Progress Test: Electricity Assessment 1</p> <p>Required Practical:</p>	<p><u>Biology</u></p> <p>Progress Test: Enzymes and digestion 6 mark question</p> <p>Required Practical: Food tests.</p> <p>Required Practical: Affect of pH on the rate of reaction of amylase</p> <p>End of topic test: Organisation and Digestion</p> <p><u>Chemistry:</u></p> <p>End of topic test: Atomic structure and periodic table</p>	<p><u>Chemistry:</u></p> <p>End of topic test: Bonding</p> <p><u>Biology:</u></p> <p>Progress check: Understanding circulation</p> <p>End of topic test: Circulation</p>	<p><u>Chemistry:</u></p> <p>End of topic test: Quantitative Chemistry</p> <p><u>Physics:</u></p> <p>Required Practical: Density</p> <p>End of topic test: Particle Model of Matter</p>	<p><u>Physics:</u></p> <p>End of Topic Test: Atomic Structure</p> <p><u>Biology:</u></p> <p>End of Topic Test: Plants and transport</p> <p>End of Year Exam. This will test pupils on all Biology, Chemistry and Physics topics covered this year.</p> <p>This will take place during Y9 exam week.</p> <p>Week beginning: 18th June</p>

	Required Practical: Specific heat Capacity End of topic test: Energy	Resistance and length of a wire Required Practical: Current Voltage relationship End of Topic Test: Electricity				
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Year 10 KS4	Autumn Term 1a (7 weeks)	Autumn Term 1b (8 weeks)	Spring Term 2a (6 weeks)	Spring Term 2b (4 weeks 2 days)	Summer Term 3a (6 weeks)	Summer Term 3b (7 weeks)
<p>Key Learning</p> <ul style="list-style-type: none"> • knowledge • skills • experiences 	<p>Key topics covered will be:</p> <p><u>Chemistry:</u></p> <p>Chemical Changes</p> <p>Reactivity of metals Extraction of metals Reactions of Acids Neutralisation and salt production. Electrolysis</p> <p><u>Biology:</u></p> <p>Communicable and non-communicable Diseases</p> <p>Body defences, Vaccinations, Antibiotics, and developing medicines.</p> <p>Risk factors Cancer</p>	<p>Key topics covered will be:</p> <p><u>Chemistry:</u></p> <p>Energy Changes and Rates of Reaction</p> <p>Exothermic and endothermic reactions</p> <p>Rates of reactions and reversible reactions</p> <p><u>Physics:</u></p> <p>Forces 1</p> <p>Forces and their interactions Work done and energy transfer Forces and elasticity</p>	<p>Key topics covered will be:</p> <p><u>Physics:</u></p> <p>Forces 2 Forces and motion</p> <p><u>Biology:</u></p> <p>Biology: Bioenergetics 1 – pupils will study the life processes of photosynthesis.</p> <p>Bioenergetics 2 – pupils will study the life processes of respiration in some detail.</p> <p>Aerobic and Anaerobic respiration</p>	<p>Key topics covered will be:</p> <p><u>Chemistry:</u></p> <p>Organic Chemistry</p> <p>Carbon compounds as fuels and feedstocks.</p> <p><u>Biology:</u></p> <p>Cells and Stem cells.</p> <p>The cell cycle, mitosis and meiosis. Stem cell research. Osmosis</p>	<p>Key topics covered will be:</p> <p><u>Physics:</u></p> <p>Waves 1</p> <p>Waves in air, fluids and solids. Properties of waves Electromagnetic waves and properties of electromagnetic Waves</p> <p><u>Chemistry:</u></p> <p>Chemical Analysis.</p> <p>Purity and formulations Chemistry of the atmosphere.</p>	<p>Key topics covered will be:</p> <p><u>Physics:</u></p> <p>Waves 2 and Magnetism and electromagnetism</p> <p>Properties of electromagnetic waves (2), uses and applications of electromagnetic waves.</p> <p>Permanent and induced magnetism, magnetic forces and fields</p> <p><u>Biology:</u></p> <p>Ecology 1</p> <p>Adaptations of plants and animals. Competition for natural resources. Biotic and abiotic factors affecting populations. Sampling. Feeding relationships</p>

<p>Key Activities promoting SMSC and British Values</p>	<p>Risk factors for heart disease and Cancer.</p> <p>Antibiotic use and resistance</p> <p>Animal testing</p> <p>Impact of a blast furnace</p>	<p>How science works: Why do chemists want to speed up reactions.</p>	<p>Understanding the use of photosynthesis</p> <p>Importance of exercise - healthy lifestyles</p>	<p>Ethics of embryonic stem cells</p> <p>Burning fossil fuels and their effect on the environment.</p>	<p>Effects of Electromagnetic waves on humans</p>	<p>How Human action affects Biodiversity.</p>
<p>Key Homework</p>	<p>Biology Homework: differences between bacteria and viruses</p> <p>Biology Homework: Non-communicable diseases</p> <p>Biology Homework: Bird Flu</p> <p>Biology Homework: Animal testing</p> <p>Chemistry Homework: GCSE question Reactivity of metals</p> <p>Chemistry Homework: Evaluation of steel production</p> <p>Chemistry Homework: Equations for acid reactions</p>	<p>Chemistry Homework: GCSE question endothermic and exothermic reactions.</p> <p>Chemistry Homework Plotting a rate of reaction graph</p> <p>Chemistry Homework: Write a plan/method for measuring ROR.</p> <p>Physics Homework: It's a balancing act</p> <p>Physics Homework: Work done calculations.</p> <p>Physics Homework: Hookes Law</p>	<p>Physics Homework: Terminal velocity</p> <p>Physics Homework: Stopping Distances</p> <p>Biology Homework: Testing for Starch</p> <p>Biology Homework: Limiting factors.</p> <p>Biology Homework: Respiration fitness</p> <p>Biology Homework: Respiration and lactic acid</p>	<p>Chemistry Homework: GCSE question – Fractional distillation</p> <p>Chemistry Homework: GCSE question - Cracking</p> <p>Biology Homework: Mitosis research</p> <p>Biology Homework: Cells and cloning</p>	<p>Physics Homework: longitudinal and transverse waves</p> <p>Physics Homework: Discovering the electromagnetic spectrum timeline</p> <p>Physics Homework: Mobile Phone Masts</p> <p>Chemistry Homework: Describe the main tests for gases.</p> <p>Chemistry Homework: timeline for the evolution of the atmosphere</p>	<p>Biology Homework: solenodon</p> <p>Biology Homework: Quadrat calculation</p> <p>Biology Homework: Predator-prey graph</p> <p>Physics Homework: Electromagnetic communications</p> <p>Physics Homework: Going for an x-ray</p> <p>Physics Homework: Infrared radiation</p>

	<p>Chemistry Homework: GCSE question Electrolysis of Bauxite</p>					
<p>Key Assessments inc. dates</p>	<p>Students will be assessed throughout this ½ term as follows:</p> <p>Biology</p> <p>Progress Test: Communicable diseases</p> <p>Progress test: understanding immune response</p> <p>Required Practical: Cultures and antiseptics</p> <p>End of topic test: Communicable and non-communicable diseases</p> <p>Chemistry</p> <p>Required Practical: Preparing a soluble salt</p>	<p>Students will be assessed throughout this ½ term as follows:</p> <p>Chemistry</p> <p>Required Practical: Variables that affect temperature change in reactions</p> <p>Required Practical: Rates of reactions</p> <p>End of topic test: Energy Changes</p> <p>End of topic test: Rates of Reaction</p> <p>Physics</p> <p>Progress test: Forces 1</p> <p>Required Practical: Hooke's Law</p>	<p>Students will be assessed throughout this ½ term as follows:</p> <p>Physics</p> <p>Required practical: Acceleration</p> <p>End of topic test: Forces</p> <p>Biology</p> <p>Required Practical: Rate of photosynthesis in pond weed</p> <p>Progress test: Photosynthesis</p> <p>Progress test: Anaerobic respiration 6 mark GCSE question.</p> <p>End of topic test: Respiration</p>	<p>Students will be assessed throughout this ½ term as follows:</p> <p>Chemistry</p> <p>End of topic test: Organic Chemistry</p> <p>Biology</p> <p>Required practical Osmosis</p> <p>End of Topic test Stem Cells</p>	<p>Students will be assessed throughout this ½ term as follows:</p> <p>Physics</p> <p>Progress test: Waves 1</p> <p>Required Practical: Measuring the speed of waves</p> <p>Chemistry</p> <p>End of topic test: Chemical Analysis</p>	<p>Students will be assessed throughout this ½ term as follows:</p> <p>Physics</p> <p>Progress test: Waves 2</p> <p>Required Practical: Infra-red radiation investigation</p> <p>End of Topic test: Waves</p> <p>Biology</p> <p>Required Practical: Using Quadrats</p> <p>Progress Test: Sampling</p>

	<p>Required Practical: Electrolysis</p> <p>End of topic test: Chemical Changes</p>	<p>Year 10 exams: covering all biology/chemistry and physics including all topics from Y9.</p> <p>Week beginning: 12th February</p>				
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Year 11 KS4	Autumn Term 1a (7 weeks)	Autumn Term 1b (8 weeks)	Spring Term 2a (6 weeks)	Spring Term 2b (4 weeks 2 days)	Summer Term 3a (6 weeks)	Summer Term 3b (7 weeks)
<p>Key Learning</p> <ul style="list-style-type: none"> • knowledge • skills • experiences 	<p>Key topics covered will be:</p> <p><u>Chemistry:</u></p> <p>Chemical Changes and Energy Changes</p> <p>Reactivity of Metals Reactions of acids Electrolysis Exothermic and endothermic reactions.</p> <p><u>Physics:</u></p> <p>Waves</p> <p>Waves in air fluids and solids Electromagnetic waves</p>	<p>Key topics covered will be:</p> <p><u>Chemistry:</u></p> <p>Rates of Reaction</p> <p>Rate of reaction Reversible Reactions and dynamic equilibrium</p> <p><u>Biology:</u></p> <p>Homeostasis and response</p> <p>Homeostasis Hormonal coordination in humans</p>	<p>Key topics covered will be:</p> <p><u>Biology:</u></p> <p>Inheritance Variation and Evolution</p> <p>Reproduction Genetic inheritance</p> <p><u>Physics:</u></p> <p>Magnetism and Electromagnetism</p> <p>Permanent and induced magnetism, magnetic forces and fields</p> <p>The motor effect.</p> <p><u>Chemistry:</u></p> <p>Chemistry of the atmosphere</p>	<p>Key topics covered will be:</p> <p><u>Biology:</u></p> <p>Cycles and Waste</p> <p>Carbon and Water cycles</p> <p>Biodiversity and the effect of human interaction on ecosystems</p> <p><u>Chemistry:</u></p> <p>Using Resources</p> <p>Using the Earth's resources and obtaining potable water</p> <p>Life cycle assessment and recycling</p>	<p>For the final term students will follow a revision program which will cover key topics, past paper questions and exam skills.</p> <p>Students must supplement their revision in lessons with a lot more revision and exam preparation at home in the final run up to the exams.</p>	<p>For the final term students will follow a revision program which will cover key topics, past paper questions and exam skills.</p> <p>Students must supplement their revision in lessons with a lot more revision and exam preparation at home in the final run up to the exams.</p>

			<p>The composition and evolution of the atmosphere</p> <p>Carbon dioxide and methane as greenhouse gases</p> <p>Common atmospheric pollutants and their sources</p>			
<p>Key Activities to promote SMSC and British Values.</p>	<p>Impact of a blast Furnace</p> <p>Effects of Electromagnetic waves on humans</p>	<p>Why industrial chemists need to speed up reactions</p> <p>Contraception/IVF and fertility treatment</p>	<p>The greenhouse effect and human actions.</p> <p>Inherited disorders</p> <p>Theory of Evolution</p>	<p>Climate Change and its effects</p>		
<p>Key Homework:</p>	<p>Chemistry Homework: GCSE question Reactivity of metals</p> <p>Chemistry Homework: Evaluation of steel production</p> <p>Chemistry Homework: Equations for acid reactions</p> <p>Chemistry Homework: GCSE question Electrolysis of Bauxite</p>	<p>Chemistry Homework Plotting a rate of reaction graph</p> <p>Chemistry Homework: Write a plan/method for measuring ROR.</p> <p>Biology Homework: Diabetes</p> <p>Biology Homework: Hormones</p>	<p>Biology Homework: DNA structure</p> <p>Biology Homework: Genetic engineering</p> <p>Biology Homework: Katy did natural selection</p> <p>Biology Homework: Fossil Evidence</p> <p>Chemistry Homework: GCSE question evolution of the atmosphere</p>	<p>Biology Homework: Carbon Cycle</p> <p>Biology Homework: Pollution indicators</p> <p>Chemistry Homework: GCSE Question on preparing potable water</p> <p>Chemistry Homework: Life cycle assessment of a product in the home</p>	<p>Revision and exam preparation.</p> <p>Minimum 6 hours per week on science</p>	<p>Revision and exam preparation.</p> <p>Minimum 6 hours per week on science</p>

	<p>Chemistry Homework: GCSE question endothermic and exothermic reactions.</p> <p>Physics Homework: longitudinal and transverse waves</p> <p>Physics Homework: Discovering the electromagnetic spectrum timeline</p> <p>Physics Homework: Mobile Phone Masts</p> <p>Physics Homework: Electromagnetic communications</p> <p>Physics Homework: Going for an x-ray</p> <p>Physics Homework: Infrared radiation</p>		<p>Chemistry Homework: Summarise the main pollutants from burning fossil fuels</p> <p>Chemistry Homework: Work out your carbon footprint</p> <p>Physics homework: The Motor Effect (an idiot's guide)</p> <p>Physics homework: EM induction exam question</p>			
Key Assessments Inc Dates	<p>Chemistry</p> <p>Required Practical: Preparing a soluble salt</p> <p>Required Practical: Electrolysis</p> <p>End of topic test: Chemical Changes</p>	<p>Chemistry</p> <p>Required Practical: Variables that affect temperature change in reactions</p> <p>Required Practical: Rates of reactions</p> <p>End of topic test: Energy Changes</p>	<p>Chemistry</p> <p>End of topic test: Chemistry of the atmosphere</p> <p>Biology</p> <p>Progress check Genetic crosses SA</p>	<p>Chemistry</p> <p>Required Practical: purification of water samples</p> <p>End of topic test: Using resources</p> <p>Biology: Pollution</p>	<p>Provisional Exam Dates:</p> <p>Each Exam is 1 hour 15 minutes.</p> <p>Tuesday 15th May: Biology paper 1</p>	<p>Provisional Exam Dates:</p> <p>Monday 11th June: Biology paper 2</p> <p>Wednesday 13th June: Chemistry paper 2</p>

	<p>Required Practical: Variables that affect temperature change in reactions</p> <p>End of topic test: Energy Changes</p> <p>Physics</p> <p>Progress test: Waves 1</p> <p>Required Practical: Measuring the speed of waves.</p> <p>Progress test: Waves 2</p> <p>Required Practical: Infra-red radiation investigation</p> <p>End of Topic test: Waves</p>	<p>End of topic test: Rates of Reaction</p> <p>Biology</p> <p>Progress check Evaluation of fertility treatment</p> <p>EOT Homeostasis</p>	<p>Progress check Natural selection</p> <p>End of topic test: Inheritance</p> <p>End of topic test: Evolution and variation</p> <p>Physics</p> <p>Required Practical: Infra-red radiation investigation.</p> <p>End of topic test: Magnetism and electromagnetism</p>		<p>Thursday 17th May: Chemistry paper 1</p> <p>Wednesday 23rd May: Physics paper 1</p>	<p>Friday 15th June: Physics Paper 2</p>
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