



CHS South Curriculum Intent

SUCCESSFUL: An education where imagination, curiosity and resilience enable us to ignite our learning.

CREATIVE: A shared belief that optimism, empathy and responsibility are the foundations for a respectful, safe and inclusive community.

HAPPY: Individuals who are ready to learn, practise being reflective, and are motivated to become champions.

CHS South Curriculum Area Framework for Learning – Years 7-10

SUBJECT	Science
INTENT	Students will learn the foundations of chemistry, biology and physics during KS3 and build upon them during KS4, with the intention of raising interest and engagement in the natural world and developing their curiosity.



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Year Group	7					
Rationale/ Narrative	To learn the “big ideas” associated with Science. To develop firm foundations in Biology, Chemistry and Physics and to explore and engage pupil’s curiosity of the natural world. Students will learn how to carry out and write scientifically and then explore the fundamental areas of science which include; cells, reproduction, atoms, electricity, photosynthesis and states of matter.					
	Autumn 1 - Cells and reproduction	Autumn 2 – Skills	Spring 1 – States of matter and separating techniques	Spring 2 – Electrical circuits and Power	Summer 1 – Atoms and elements	Summer 2 – Plant structure and interdependence
KNOWLEDGE	Menstrual cycle Cells (specialised cells, animal and plant structure) Labelling and describing cell organelles Reproductive system Fertilisation Puberty Using microscopes	HSW Skills Practical skills and writing scientifically Command words Repeats, means, anomalies, accuracy, errors. Variables and methods. Graphs Sample size (range, intervals and scale) Control groups.	States of matter (solids, liquids and gases) Conservation of matter Boiling Melting Stearic acid (latent heat investigation) Solubility Separating techniques Filtration, evaporation, condensation, distillation and chromatography	Elements, compounds and mixtures Using the Periodic table Group 1 in the periodic table Chemical reactions Structure of an atom Electron shells Atomic and mass number Reactivity of metals Investigating the reactivity of metals Exothermic and endothermic reactions	Series and parallel circuits Conductors and insulators Measuring current and Voltage Magnetism Electromagnetism Generating electricity Power stations National Grid	Photosynthesis Testing leaves for starch Investigating photosynthesis Food chains Food webs Insect pollination Leaf structure Seed dispersal Observing Stomata
SKILLS	Learning how to use a microscope Memory recall – for cell parts and the reproductive systems Creative writing – journey of a sperm	Learning Command words and carrying out/writing up scientific investigations. How Science Works key terms Repeats Means Anomalies Errors Accuracy Resolution Range Interval	Group work: Students will carry out/write up scientific investigations: <ul style="list-style-type: none"> Conservation of mass Rate of evaporation Cooling curve for stearic acid Investigating solubility, 	Group work: Students will produce a presentation about the structure of the atom Students will carry out/write up scientific investigations: <ul style="list-style-type: none"> Students will investigate reactions to see 	Group work: Students will carry out/write up scientific investigations: <ul style="list-style-type: none"> Students will test conductors Students will investigate current in series and parallel circuits Students will investigate 	Group work: Students work as a team to complete complex food webs Students will carry out/write up scientific investigations: <ul style="list-style-type: none"> Iodine test for starch Testing rate of photosynthesis using pond weed



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		<p>Scale Variables Graphs plotting Graphs analysis</p>	<p>melting and boiling points</p> <ul style="list-style-type: none"> Evaporation and condensation Chromatography distillation 	<p>if they are exo or endothermic</p> <ul style="list-style-type: none"> Students will investigate metals with acid to see the temperature change (reactivity) Students will heat metals with oxygen. <p>Students will produce a presentation about how a power station works (oracy)</p>	<p>voltage in series and parallel circuits</p> <ul style="list-style-type: none"> Students will investigate static electricity and use a Van der graff generator. 	<ul style="list-style-type: none"> Observe stomata using a microscope
<p>ASSESSMENTS</p>	<p>Students will be assessed on:</p> <ul style="list-style-type: none"> Writing creatively: (journey of sperm) – students will use the skills they have learnt in English to write about the journey of sperm through the female reproductive system. Progress test: This will test understanding of how science works skills (covering all the topic areas described in 	<p>Students will be assessed on:</p> <p>How to draw a line graph and a bar chart. This will include appropriate use of categoric and continuous data.</p> <ul style="list-style-type: none"> Writing scientifically: Students will learn to write a scientific report and write a conclusion for the following investigations: How changing the size of meteors affects the size of a crater How changing the shape of a boat affects how 	<p>Students will be assessed on:</p> <ul style="list-style-type: none"> Pupils will write a scientific report about the cooling rate of stearic acid. Multiple choice revision test (covering all the topic areas described in spring 1 – knowledge above). 	<p>Students will be assessed on:</p> <ul style="list-style-type: none"> Writing scientifically: pupils will write a scientific report about the reactivity of metals with hydrochloric acid. Atomic structure presentation. Students will research and present work about the periodic table and the structure of the atom. Multiple choice revision test (covering all the topic areas 	<p>Students will be assessed on:</p> <ul style="list-style-type: none"> Pupils will write a scientific report about circuits (both series and parallel). Progress test: This will test understanding of how science works skills (covering all the topic areas described in autumn and spring – knowledge). 	<p>Students will be assessed on:</p> <ul style="list-style-type: none"> Pupils will write a scientific report about how the rate of photosynthesis is affected by the intensity of a light Pupils will design a food web using information cards and then present the work to their peers or the class. (Oracy task) Progress test (this will cover all the knowledge they have developed



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	<p>autumn 1 and 2 – knowledge).</p> <ul style="list-style-type: none"> MCT – revision (cells and reproduction) 	<p>much weight it can hold before sinking.</p>		<p>described in spring 1 – knowledge above).</p>		<p>throughout the whole year).</p>
HOME LEARNING	<p>TEAMS homework's relevant to the topic being studied - one per week</p>	<p>TEAMS homework's relevant to the topic being studied.</p> <p>Revision booklet relevant to the End of Topic Test.</p>	<p>TEAMS homework's relevant to the topic being studied - one per week</p>	<p>TEAMS homework's relevant to the topic being studied.</p> <p>Revision booklet relevant to the End of Topic Test.</p>	<p>TEAMS homework's relevant to the topic being studied - one per week</p>	<p>TEAMS homework's relevant to the topic being studied.</p> <p>Revision booklet relevant to the End of Topic Test.</p>
READING, WRITING, TALK	<p>Writing: students will use the creative writing skills they have learnt in English to produce a piece of creative writing in science. This will link to fertilisation and is about the journey of sperm cell through the female reproductive system.</p>	<p>Reading: students will read and analyse various texts that given them a firmer understanding of the key words shown below. They will carry out comprehension exercises to help them develop higher levels of literacy.</p> <p>Writing: Students will learn how to write scientifically. They will write a scientific report that demonstrates how to use evidence to test a scientific hypothesis. This will be about the time taken for tea to dissolve.</p>		<p>Oracy: Students will research atomic structure and then present their work in pairs to the rest of the class. This will help to develop their spoken English and confidence in speaking in front of an audience</p> <p>Writing: Students will learn how to write scientifically. They will write a scientific report that demonstrates how to use evidence to test a scientific hypothesis. This will be about the reactivity of metals.</p>	<p>Writing: Students will learn how to write scientifically. They will write a scientific report that describes current and voltage in both series and parallel circuits.</p>	<p>Reading: students will read texts about interdependence and feeding relationships. They will carry out comprehension exercises to help them develop higher levels of literacy specific to how energy is transferred along a food chain or web.</p> <p>Writing: Students will learn how to write scientifically. They will write a scientific report that describes how light intensity affects the rate of photosynthesis.</p>
TIER 3 VOCAB	<p>SEEC:</p> <ul style="list-style-type: none"> reproduction specialised adapted fertilisation magnification 	<p>SEEC:</p> <ul style="list-style-type: none"> Categoric Continuous Describe Explain Conclusion Evaluation 	<p>SEEC:</p> <ul style="list-style-type: none"> state matter conservation conduction convection evaporation 	<p>SEEC:</p> <ul style="list-style-type: none"> element compound mixture reactivity exothermic 	<p>SEEC:</p> <ul style="list-style-type: none"> voltage current conductor insulator attract repel 	<p>SEEC:</p> <ul style="list-style-type: none"> photosynthesis pollination dispersal producer



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		<ul style="list-style-type: none"> • Independent • dependent 	<ul style="list-style-type: none"> • condensation 	<ul style="list-style-type: none"> • endothermic 		<ul style="list-style-type: none"> • consumer
<p>PSPSMC, BRITISH VALUES</p>	<p>Social: Students will make, bake and sell their cells cakes as part of their autumn 1 science homework. The money raised will be given to local charities reinforcing the importance of kindness within our local communities.</p> <p>Social/Moral and Cultural: Students will learn about puberty and conception. They will discuss the issues surrounding fertility and the impact that this can have on parents. Students may also discuss the issues surrounding embryos and the objections that can be made surrounding embryo technology.</p>			<p>Cultural: Students will learn about the role of Dmitri Mendeleev. They will learn how the periodic table was designed and improved to become the document is today. This will reinforce the importance of scientific curiosity and hopefully engage them with scientific process. Demonstrating the importance of science internationally, as it provides all cultures the ability to answer some of life's fundamental questions.</p>	<p>Social: Students will learn about the generation of electricity and discuss the issue facing the world's population in the future. They will discuss renewable technologies and evaluate the advantages and disadvantages of a future that uses cleaner fuels.</p>	<p>Social: Students will learn about the importance of plants both locally and internationally. They will learn how crop populations are affected by the decrease in insect pollinating species like bees. Students will also learn the importance of plants in food production and how this links to all food chains on earth.</p>



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Year Group	8					
Rationale/ Narrative	To further develop knowledge in Biology, Chemistry and Physics and to explore and engage pupil's curiosity of the natural world. Students will continue to develop their ability to write and carry out scientific investigations and then explore more fundamental areas of science which include; disease, immunity, diet, health, organ systems, separation techniques, forces, motion and evolution.					
	Autumn 1 – Health, nutrition and organ systems	Autumn 2 – Forensics (separating techniques, acids and alkalis)	Spring 1 – Genes and Evolution	Spring 2 – Disease (transmission and immunity)	Summer 1 – waves and energy transfer	Summer 2 Motion and Forces (speed and energy transfers)
KNOWLEDGE	Health and Nutrition Diet. Food groups Food tests Diabetes. Digestive system. Modelling the journey of food. Enzyme digestion Respiratory system Gas exchange Impact of exercise Heart <i>Drugs (recreational and drugs in sport).</i>	Forensics Separating Mixtures States of Matter Density Measuring pH Neutralisation Acids and Alkalis Using Indicators	Genes and Evolution Variation The structure of DNA Genes, chromosomes and the nucleus Genetic modification Selective breeding Natural selection Evolution Extinction Wild life conservation	Bacterial disease Viral disease Fungal disease Bacterial numeracy Malaria Transmission and defence immunity Spreading microbes Human defence system Defence Vaccination MMR Antibiotics and pain killers MRSA	Energy transfer Waves Wave equations Transverse and longitudinal waves Reflection Refraction Dispersion Sound Transfer of sound through matter Structure of the Ear	Motion and Forces Measuring forces Resultant force Friction Gravity Air resistance Hooke's Law Calculating speed Distance time graphs Speed and velocity Acceleration
SKILLS	Students will learn to write persuasive articles. Students will learn how to evaluate models and carry out dissections Students will carry out/write up scientific investigations:	Students will carry out/write up scientific investigations: <ul style="list-style-type: none"> Students will investigate density Students will investigate the 	Students will develop oracy and presentation skills. Students will also learn how to write evaluations and comparisons effectively.	Students will carry out/write up scientific investigations: <ul style="list-style-type: none"> Students will investigate antibiotics Students will investigate the 	Students will carry out/write up scientific investigations: <ul style="list-style-type: none"> Students will investigate waves in solids and liquids Students will investigate ray 	Students will learn how to use and apply key terminology and data such as: Repeats Reliability Reproducibility Mean Error Accuracy



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	<ul style="list-style-type: none"> Students will investigate food groups and food tests Students will investigate the pH of different substances Students will carry out filtration and evaporation techniques. Students will learn the importance of sample size when carrying out research projects, and consider factors that might affect a scientific study. (e.g. age/gender etc.) 	<p>pH of different substances</p> <ul style="list-style-type: none"> Students will carry out filtration and evaporation techniques. 		<p>spread of bacteria</p> <ul style="list-style-type: none"> Students will investigate how to spread bacteria 	<p>diagrams (reflection and refraction)</p> <ul style="list-style-type: none"> Students will investigate the speed of sound in air 	<p>Students will carry out/write up scientific investigations:</p> <ul style="list-style-type: none"> Students will investigate speed Students will investigate the extension of a spring Students will design and present information about the energy changes in a rollercoaster
ASSESSMENTS	<p>Students will be assessed on:</p> <ul style="list-style-type: none"> Pupils will write a scientific report that describes how to test proteins, carbohydrates and fats. (peer assessment) Writing creatively (journey of a cheese sandwich) 	<p>Students will be assessed on:</p> <ul style="list-style-type: none"> Writing a scientific report about how to calculate density Multiple choice revision test (covering knowledge from Autumn 2 Yr8) Progress test (all knowledge content from Autumn 1 and 2) 	<p>Students will be assessed on:</p> <ul style="list-style-type: none"> Writing an evaluation about the positives and negatives of selective breeding MCT – revision (covering knowledge from summer 1 Yr8) 	<p>Students will be assessed on:</p> <ul style="list-style-type: none"> Writing a persuasive argument. Should we vaccinate? Oracy task – pupils will also give speeches about the importance of vaccinations Progress test (all knowledge) 	<p>Students will be assessed on:</p> <ul style="list-style-type: none"> Waves assessment Writing a scientific report about how to measure reflection and refraction in a glass block. MCT – revision (covering knowledge from spring 2 Yr8). 	<p>Students will be assessed on:</p> <p>Forces assessment</p> <ul style="list-style-type: none"> MCT – revision (covering knowledge from summer 2 Yr8) Progress test (all knowledge content from Autumn, spring and summer)



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	<ul style="list-style-type: none"> • Writing creatively (Journey of an oxygen molecule) • Multiple choice revision test (covering knowledge from Autumn 1 Yr8) 			content from Year 7).		
HOME LEARNING	TEAMS homework's relevant to the topic being studied - one per week	TEAMS homework's relevant to the topic being studied. Revision booklet relevant to the END OF TOPIC TEST.	TEAMS homework's relevant to the topic being studied - one per week	TEAMS homework's relevant to the topic being studied. Revision booklet relevant to the END OF TOPIC TEST.	TEAMS homework's relevant to the topic being studied - one per week	TEAMS homework's relevant to the topic being studied. Revision booklet relevant to the END OF TOPIC TEST.
READING, WRITING, TALK	<p>Reading: students will read and analyse various texts that given them a firmer understanding of the key words shown below. They will carry out comprehension exercises to help them develop higher levels of literacy.</p> <p>Writing: students will use the creative writing skills they have learnt in English to produce a piece of creative writing in science. This will link to digestion and is about the journey of a cheese sandwich through the digestive system.</p>	<p>Writing: Students will learn how to write scientifically. They will write a scientific report that demonstrates how to use evidence to test a scientific hypothesis. This will be about how to calculate density in regular and irregular shaped objects.</p>	<p>Reading: students will read texts about genetics and evolution. They will carry out comprehension exercises to help them develop higher levels of literacy specific to how energy is transferred along a food chain or web.</p> <p>Writing: Students will write an essay about the evolution of the Neanderthals. Using knowledge and skills that they have learnt throughout the topic to supplement their work.</p>	<p>Writing: Students will learn how to write scientifically. They will write a scientific report that demonstrates how to use evidence to test a scientific hypothesis. This will be about aseptic technique. They will write about how to spread bacteria aseptically.</p> <p>Reading: students will read and analyse various texts that given them a firmer understanding of the key words shown below. They will carry out comprehension exercises to help them develop higher levels of literacy.</p>	<p>Writing: Students will learn how to write scientifically. They will write a scientific report that demonstrates understanding of reflection and refraction. This will include ray diagrams from the practical they have</p>	<p>Writing: Students will learn how to write scientifically. They will write a scientific report that describes how a spring behaves under load.</p>
TIER 3 VOCAB	SEEC: <ul style="list-style-type: none"> • Digestion 	SEEC: <ul style="list-style-type: none"> • Indicator 	SEEC: <ul style="list-style-type: none"> • Variation 	SEEC: <ul style="list-style-type: none"> • Disease 	SEEC:	SEEC: <ul style="list-style-type: none"> • Potential energy



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	<ul style="list-style-type: none"> • Diffusion • Alveoli • Villi • Circulatory • Respiratory 	<ul style="list-style-type: none"> • State of matter • Separation • Filtration • Mixture • Distillation • Density 	<ul style="list-style-type: none"> • Evolution • Genetic • Environmental • Mutation • Conservation • Extinction 	<ul style="list-style-type: none"> • Immunity • Transmission • Communicable • Pathogen • Aseptic • vaccination 	<ul style="list-style-type: none"> • Reflection • Refraction • Energy • Transverse • Longitudinal 	<ul style="list-style-type: none"> • Conservation • Elastic • Deformation • Extension • compression
PSPSMC, BRITISH VALUES	<p>Physical, Social and cultural: Students will learn about the importance of a healthy diet. They will learn about non – communicable diseases that can be obtained through a lack of exercise and poor diet. They will also discuss the impact diet can have on physical, and mental health, and its effects on society as a whole.</p>	<p>Social: Students will learn about the wider role that acids and alkalis play in society. From cleaning products and sanitisers through to foods. Giving context to the chemicals they use in the classroom and the dangers they can pose in society.</p>	<p>Moral, Social and cultural: Students will learn about the importance of animal conservation and the role humans can play in protecting endangered species from extinction. They will learn / research specific animals like the elephant and rhino and discuss ideas they implement personally to improve the overall welfare of animals within our society and the world.</p>	<p>Social and Cultural: Students will learn about the transfer of various diseases. They will learn about the importance of vaccinations and the myths and misconceptions that currently surround these topics. Moral: Students will discuss the morality of forcing members of society to be vaccinated. Students will learn about the impact of communicable disease like malaria and gonorrhoea and how we can prevent the transmission of disease to reduce the use of antibiotics in society.</p>		



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Year Group	9					
Rationale/ Narrative	In year 9 pupils will continue to follow the KS3 national curriculum and develop their understanding of topical issues that currently polarise national and international opinions: like global warming, power generation, stem cells and lifestyle choices. Pupils will link what they learn in year 9 to the fundamental concepts they have developed in years 8 and 9 and build upon their evaluating and data handling skills, so that they can become the analytical scientific minds of the future.					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
KNOWLEDGE	Energy Energy stores Energy transfers Energy efficiency Energy dissipation Power Energy costs Power stations Non renewable energy Renewable energy Evaluating energy sources.	The Earth's structure, atmosphere and the planets. Global warming The rock cycle (types of rock) The Earth's structure Composition of the atmosphere Days and seasons Space (planets, stars and galaxies) Gravity on Earth	Cellular Processes Cells Types of cells Cell differentiation and growth Stem cells Diffusion and active transport in cells Osmosis in cells Investigating osmosis in cells Aerobic and anaerobic respiration in cells systems	Principles of organization and disease Cells to tissues Digestive enzymes and digestion Investigating enzymes in digestion Health issues Lifestyle choices Cancer The heart and blood vessels Components of the blood Coronary heart disease	Energy efficiency work and power Power work Conservation and dissipation of energy Energy transfers in a system Efficiency Specific heat capacity	Retrieval practice atoms and elements Waves light and sound Speed and Forces Electricity and magnetism Plants and Photosynthesis States and separating techniques
SKILLS	Evaluation of energy resources using data sources. Analyse advantages and disadvantages of renewable energy. Students will build a model power station in groups and produce a presentation about the different parts. They will also discuss the issues surrounding non	Analysis of data from the department of energy relating to global warming. Interpret graphs showing climate change data. Practical skills- analysis of rock samples, and identification using data. Use of prefixes-kilo, mega, giga.	Practical skills- Osmosis practical: measuring the change in mass of potato pieces. Exercise practical: measuring change in pulse rate and breathing rate. Interpret/analyse data from tables and graphs.	Students will learn how to investigate the effect of different factors on enzyme activity. Students will use models to explain enzyme action.	A large focus on Maths in Science Students will learn how to calculate energy changes Recall and apply the following equations: $KE = \frac{1}{2} mv^2$ $GPE = mgh$ $P = E/t$ $P = W/t$ Use of equations to calculate efficiency	Recall and apply the following equations: $s = \lambda \times f$ $F = ma$ $V = d/t$



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	renewable resources like coal and gas.		Draw conclusion from experimental data			
ASSESSMENTS	<p>Students will be assessed on:</p> <p>Pupils will evaluate the positives and negatives of renewable and non renewable power.</p> <p>Pupils will build a model Power station and then present their work to their peers (Oracy task – group work)</p>	<p>Students will be assessed on:</p> <p>How to save the world write up-letter on how to reduce climate change.</p> <p>End of topic test (L1/L2/L3) or Earth and space MCT</p> <p>Progress test End of KS3 Exam</p>	<p>Students will be assessed on:</p> <p>Investigating osmosis in cells (potato)</p>	<p>Students will be assessed on:</p> <p>Progress test</p> <p>Organisation MCT</p> <p>Progress test Autumn and Spring content</p>	<p>Students will be assessed on:</p> <p>Write up / how to use microscopes and produce magnified images.</p>	<p>Students will be assessed on:</p> <p>End of year test</p>
HOME LEARNING	TEAMS homework's relevant to the topic being studied - one per week	<p>TEAMS homework's relevant to the topic being studied.</p> <p>Revision booklet relevant to the END OF TOPIC TEST.</p>	TEAMS homework's relevant to the topic being studied - one per week	TEAMS homework's relevant to the topic being studied.	TEAMS homework's relevant to the topic being studied - one per week	TEAMS homework's relevant to the topic being studied.
READING, WRITING, TALK	<p>Talk: Students learn about the structure and function of a gas/coal power station through talk and discuss the issues surrounding their use.</p> <p>Writing: Students write an evaluation of renewable and non renewable power</p>	<p>Reading: Students will read various articles on fossil fuels and a crematorium to evaluate the use of fossil fuels.</p> <p>Students will read information slides relating to global warming and use these to answer comprehension questions.</p> <p>Writing: Students will write a letter to the government detailing steps they can</p>	<p>Reading, Writing and Talk: Students learn about plant organisation through talk. They will quiz each other, ask and answer questions and offer instructions to a partner drawing plant structures.</p> <p>Writing: Students will continue to write scientifically in their write up of required practical- Investigating photosynthesis. This will</p>	<p>Talk: Students talk about how lifestyle choice can affect their physical and mental health using the science faculty ABC oracy strategies.</p> <p>Writing: Students will write up the investigation on the conditions which affect enzyme activity.</p>	<p>Talk: Students talk about how energy is transferred from one store to another.</p> <p>Writing: They will write up the investigation on how different types of insulation affect heat transfer.</p> <p>Reading: They will read about different types of insulation.</p>	<p>Talk: Students talk about which techniques are used to separate different mixtures.</p> <p>Writing: They will be applying their knowledge of KS3 to answer extend written answers from the KS3 curriculum.</p>



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		take to minimise global warming and the impacts of using non-renewable energy. They will also analyse letter structure in this task.	include forming a hypothesis, identifying variables and interpretation of data.			Reading: Using the CHS south reading strategies to analyse and deconstruct KS3 assessment questions.
TIER 3 VOCAB	Renewable Non Renewable Finite Replenished	Sedimentary Igneous Metamorphic Erosion Compaction	DNA Genome Variation Organisation Osmosis Diffusion Enzyme Benign Malignant Tumour / cancer	Cells Tissues Organs Organ systems Enzymes Biological catalysts Lipase Amylase Protease Carbohydrase Stomach Small intestine Diffusion Absorption Obesity Anorexia Depression Statins White blood cells Red blood cell Platelets Plaques Cholesterol	Watts Joules Power Kinetic Gravitational Thermal Energy stores Radiation Forces Electricity Efficiency Specific heat capacity	Proton Neutron Electron Shells/energy levels Amplitude Frequency Wavelength Displacement Time period North pole South pole Attract Repel Chloroplast Chlorophyll Glucose Pigment Solid Liquid Gas Freeze Melt Boil Evaporate Condense Sublime Chromatography Filtration Crystallization Distillation
PSPSMC, BRITISH VALUES	Social, Moral and Spiritual: Exploring issues around renewable and non-	Social and Moral: Students will learn about their carbon footprint, and how this impacts globally on climate change.	Social and Moral: Students will explore the issues around health and what they can do to lead a healthier lifestyle and	Social and Moral: Students will explore the issues around health and what they can do to lead a healthier lifestyle and	Social and Moral: Students will explore the issues around how we generate electricity and the impacts on the	Social and Moral: Students will learn about how water can be separated from salt water to create clean drinking



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	<p>renewable energy resources. Students will learn discuss and present work about the importance or renewable technologies. They will also evaluate the issues surrounding fossil fuels and global warming.</p>	<p>Students will learn simple changes that they can make to reduce their carbon footprint.</p> <p>Students will also learn about the Earth's atmosphere and how this is damaged by human activity.</p>	<p>ways to avoid / reduce the risk of CHD and cancer.</p> <p>Students will also discuss the arguments over STEM cell use and treatments.</p> <p>Social, Moral and Spiritual: Exploring issues around stem cell research.</p> <p>Social and Moral: Students will evaluate the use of gene therapy and embryo screening.</p>	<p>ways to avoid / reduce the risks of obesity and health related conductions.</p>	<p>environment. Are we living in a sustainable way?</p>	<p>water in countries who don't have a safe supply.</p>
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Year Group	10					
Rationale/ Narrative	<p>In year 10, pupils will continue to develop the skills they have learnt at KS3 and prepare for their unit 1 examinations at the end of the year. Students will cover a wide range of topics described below (which can be found in the unit 1 AQA trilogy specification). This will help to equip the students with the knowledge base and skills to pursue further education in science and hopefully a future career in STEM.</p> <p>The numbers below reference the AQA specification which can be accessed via this link (this is the programme of study followed in years 10 and 11) : https://filestore.aqa.org.uk/resources/science/specifications/AQA-8464-SP-2016.PDF</p>					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
KNOWLEDGE	<p>Chemistry – 5.1 Atomic structure and the periodic table</p> <p>5.1.1.1 Atoms, elements and compounds</p> <p>5.1.1.2 Mixtures</p> <p>5.1.1.3 The development of the model of the atom (common content with physics)</p> <p>5.1.1.4 Relative electrical charges of subatomic particles</p> <p>5.1.1.5 Size and mass of atoms</p> <p>5.1.1.6 Relative atomic mass</p> <p>5.1.1.7 Electronic structure</p> <p>5.1.2.1 The periodic table</p> <p>5.1.2.2 Development of the periodic table</p> <p>5.1.2.3 Metals and non-metals</p> <p>5.1.2.4 Group 0</p> <p>5.1.2.5 Group 1</p> <p>5.1.2.6 Group 7</p>	<p>Physics – 6.3 Particle model of matter</p> <p>6.3.1.1 of materials</p> <p>6.3.1.2 Changes of state</p> <p>6.3.2.1 Internal energy</p> <p>6.3.2.2 Temperature changes and specific heat capacity</p> <p>6.3.2.3 Changes of state and latent heat</p> <p>6.3.3.1 Particle motion of gases</p> <p>Biology – 4.3 Infection and response</p> <p>4.3.1.1 communicable diseases</p> <p>4.3.2.1. viral diseases</p> <p>4.3.1.3 Bacterial diseases</p> <p>4.3.1.4 Fungal diseases</p> <p>4.3.1.5 Protist diseases</p> <p>4.3.1.6 Human defence systems</p> <p>4.3.1.7 Vaccination</p> <p>4.3.1.8 Antibiotics and Pain killers</p>	<p>Biology 4.1</p> <p>4.1.3.1 Diffusion</p> <p>4.1.3.2 Osmosis and required practical activity 2 (investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue).</p> <p>Physics 6.4</p> <p>6.4.1.1 The structure of an atom</p> <p>6.4.2.1 Mass number, atomic number and isotopes</p> <p>6.4.1.3 The development of the model of the atom</p> <p>6.4.2.1 Radioactive decay and nuclear radiation</p> <p>6.4.2.2 Nuclear equations</p> <p>6.4.2.3 Half life</p> <p>6.4.2.4 Radioactive contamination</p> <p>Biology 4.4</p> <p>4.4.1.1 Photosynthetic reaction</p> <p>4.4.1.2 Rate of photosynthesis</p>	<p>Physics 6.2</p> <p>6.2.1.1 Circuit diagrams</p> <p>6.2.1.2 Electrical charge and current</p> <p>6.2.1.3 Current, resistance and potential difference</p> <p>6.2.1.4 Resistors</p> <p>6.2.2 Series and parallel circuits</p> <p>6.2.3.1 AC and DC</p> <p>6.2.3.2 Mains Electricity</p> <p>6.2.4.1 Power</p> <p>6.2.4.2 Energy transfers in everyday appliances</p> <p>6.2.4.3 The national grid</p>	<p>Chemistry 5.4</p> <p>5.4.1.1 Metal oxides</p> <p>5.4.1.2 The reactivity series</p> <p>5.4.1.3 Extraction of metals</p> <p>5.4.1.4 Oxidation and reduction</p> <p>5.4.2.1 Reaction of acids with metals</p> <p>5.4.2.2 Neutralisation of acids and salts</p> <p>5.4.2.3 Soluble salts</p> <p>5.4.2.4 The pH scale</p> <p>5.4.2.5 Strong and weak acids</p> <p>5.4.3.1 The process of electrolysis</p> <p>5.4.3.2 Electrolysis of ionic compounds</p> <p>5.4.3.3 extraction using electrolysis</p> <p>Chemistry 5.5</p> <p>5.5.1.1 Exo and Endothermic reactions</p> <p>5.5.1.2 Reaction profiles</p>	<p>Biology 4.5</p> <p>4.5.1. Homeostasis</p> <p>4.5.2 The human nervous system</p> <p>4.5.3 Hormonal coordination in humans</p> <p>4.5.3.2 Control of blood glucose</p> <p>4.5.3.3 Hormones in human reproduction</p> <p>4.5.3.4 Contraception</p> <p>4.5.3.5 Hormones and fertility</p> <p>4.5.3.6 Feedback systems</p>



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	<p>Chemistry – 5.2 Bonding, structure, and the properties of matter</p> <p>5.2.1.1 Chemical bonds 5.2.1.2 Ionic bonding 5.2.1.3 Ionic compounds 5.2.1.4 Covalent bonding 5.2.1.5 Metallic bonding 5.2.2.1 The three states of matter 5.2.2.2 State symbols 5.2.2.3 Properties of ionic compounds 5.2.2.4 Properties of small molecules 5.2.2.5 Polymers 5.2.2.6 Giant covalent structures 5.2.2.7 Properties of metals and alloys 5.2.2.8 Metals as conductors 5.2.3.1 Diamond 5.2.3.2 Graphite 5.2.3.3 Graphene and fullerenes</p>	<p>4.3.1.9 Discovery and development of drugs</p>	<p>4.4.1.3 Use of glucose 4.4.2.1 Aerobic and Anaerobic 4.4.2.2 Response to exercise 4.4.2.3 Metabolism</p>		<p>5.5.1.3 Energy change of reactions</p> <p>Chemistry 5.3</p> <p>5.3.1.1 Conservation of mass and balanced chemical equations 5.3.1.2 Relative formula mass 5.3.1.3 Mass changes 5.3.1.4 Chemical measurements 5.3.2.1 Moles 5.3.2.2 Amount of substances in equations 5.3.2.3 Using Moles to balance equations 5.3.2.4 Limiting reactions 5.3.2.5 Concentration of solutions</p> <p>Revision for unit 1 exam. All AQA unit 1 topics.</p>	
<p>SKILLS</p>	<p>Students will continue to develop their modelling and evaluative skills.</p> <p>Pupils will learn how to represent the first 20 elements in both numerical form and as a diagram showing electron configuration.</p>	<p>Particle model of matter A large part of the unit will focus on mathematical skills, students will be required to recall and use the following equations.</p> <p>$\rho = m / V$ $\Delta E = m c \Delta \theta$ $E = m L_v$</p>	<p>Atomic Structure Recognise and use expressions in standard form.</p> <p>Know the nature, uses of and penetrating powers of alpha, beta and gamma ionising radiations.</p>	<p>Electricity Knowledge and use of circuit symbol.</p> <p>Recall and apply: $Q=It$ $V= IR$ $P= VI$ $P= I^2R$ $E= Pt$</p>	<p>Quantitative chemistry Use of ratios, fractions and percentages in Chemistry calculations.</p> <p>Use of relative formula mass to calculate the moles in a given mass and vice versa.</p>	<p>Homeostasis and response Evaluate information around the relationship between obesity and diabetes, and make recommendations, taking into account social and ethical issues.</p>



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	<p>Students will also use the periodic table to make predictions on reactivity.</p> <p>Understand how theories develop linked to the development of the periodic table.</p> <p>Learning how scientists predicted properties down periodic table groups.</p> <p>They will use more modelling to visualise and represent 2D and 3D forms of chemical bond.</p> <p>Be able to draw dot and cross diagrams to represent ionic and covalent bonds.</p> <p>Infection and response</p> <p>Students will look at the various types of pathogens and the effects that they can have on various organisms. They will study the transmission, symptoms and treatment of the various pathogens.</p> <p>Students will study the action of their own bodies defence systems in dealing with pathogens.</p>	<p>$E = m L_f$</p> <p>Students will complete:</p> <ul style="list-style-type: none"> RP 17 – density RP 13 – SHC <p>including associated write up / analysis and processing of results</p> <p>Students will use modelling to represent kinetic theory of particles in solids, liquid and gases</p>	<p>Use of nuclear equations to show alpha and beta decay.</p> <p>Interpret half-life graphs and use these to calculate half-life of a radioactive source, also to use this information to decide on a suitable half life appropriate for the use of particular ionising radiation in a particular situation.</p> <p>Be able to decide between irradiation and contamination.</p> <p>Bioenergetics</p> <p>Students will complete: RP 5 – photosynthesis including associated write up / analysis and processing of results.</p>	<p>$E = QV$</p> <p>Students will also be able to distinguish between the advantages / disadvantages and applications of d.c and a.c.</p> <p>Students will carry out and write up aspects of scientific investigations into:</p> <ul style="list-style-type: none"> - testing electrical conductors, - current in series and parallel circuits, - voltage in series and parallel circuits, <p>Students will complete:</p> <ul style="list-style-type: none"> RP 15 resistance RP 16 IV characteristics <p>including associated write up / analysis and processing of results.</p> <p>Investigate the effect of light on an LDR and temperature on a thermistor.</p> <p>Chemical changes and Energy Changes</p> <p>Students will study the reactivity series and learn</p>	<p>The rate and extent of chemical change</p> <p>Understand the concept of conservation of mass and how this can be used in measuring a rate in a reaction where a gas is given off.</p> <p>Drawing and interpreting appropriate graphs from data to determine rate of reaction.</p> <p>Plot two variables from experimental or other data.</p> <p>Determine the slope and intercept of a linear graph.</p> <p>Draw and use the slope of a tangent to a curve as a measure of rate of change.</p> <p>Students will complete:</p> <ul style="list-style-type: none"> RP 11 rate of reaction <p>including associated write up / analysis and processing of results.</p>	<p>Interpret and explain simple diagrams of negative feedback control.</p> <p>Show why issues around contraception cannot be answered by science alone.</p> <p>Model behaviour of chromosomes</p> <p>Use probability, proportion and ratios in relation to inheritance.</p> <p>Interpret information about genetic engineering techniques and to make informed judgements about issues concerning cloning and genetic engineering, including GM crops.</p>
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	Interpret data about vaccination / risk factors for specific diseases.			<p>how to make predictions about the extraction of metals from their ores and study the processes required to do so such as displacement / reduction and electrolysis.</p> <p>Students will learn the process of neutralisation and how pH changes accordingly.</p> <p>Students will complete:</p> <ul style="list-style-type: none"> • RP 8 – salt preparation • RP 9 - electrolysis • RP 10- temperature changes <p>including associated write up / analysis and processing of results.</p>		
ASSESSMENTS	<p>Students will be assessed on:</p> <p>Writing a comparison for groups 1,7 and 0</p> <p>Writing a comparison for Bonding (ionic / covalent and metallic) Bonding MCT</p> <p>EOT test covering chemistry learnt in year 10. Units 5.1 and 5.2</p>	<p>Students will be assessed on:</p> <p>Progress test – Unit 1 topics (6.1,5.1,5.2,4.2,4.3)</p> <p>Students will be assessed on EOT infection.</p>	<p>Students will be assessed on:</p> <p>Key skills (hypothesis, conclusion and validity) when writing up Required practical 2 osmosis.</p> <p>Progress test – Unit 1 topics (6.1,5.1,5.2,4.2,4.3)</p>	<p>Students will be assessed on:</p> <p>Aspects of a full practical write up related to</p> <ul style="list-style-type: none"> • RP 15 resistance • RP 16 IV characteristics <p>Progress test – Unit 1 (topics 6.1,6.3,5.1,5.2,4.1,4.2,4.3)</p>	<p>Students will be assessed on:</p> <p>Aspects of a full practical write up related to</p> <ul style="list-style-type: none"> • RP 11 rate of reaction <p>End of topic tests</p>	<p>Students will be assessed on:</p> <p>Aspects of a full practical write up related to</p> <ul style="list-style-type: none"> • RP 18 force and extension • RP 19 force and acceleration <p>Progress test – Unit 1 (all unit 1 – GCSE unit 1 paper)</p>



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				<p>Aspects of a full practical write up related to Required Practicals 8,9 and 10.</p> <ul style="list-style-type: none"> • RP 8 – salt preparation • RP 10- temperature changes <p>End of topic test</p>		
HOME LEARNING	<p>TEAMS homework's relevant to the topic being studied.</p> <p>One per week</p>	<p>TEAMS homework's relevant to the topic being studied.</p> <p>Revision booklet relevant to the END OF TOPIC TEST.</p>	<p>TEAMS homework's relevant to the topic being studied.</p> <p>One per week</p>	<p>TEAMS homework's relevant to the topic being studied.</p> <p>Revision booklet relevant to the END OF TOPIC TEST.</p>	<p>TEAMS homework's relevant to the topic being studied.</p> <p>One per week</p>	<p>TEAMS homework's relevant to the topic being studied.</p> <p>Revision booklet relevant to the END OF TOPIC TEST.</p>
READING, WRITING, TALK	<p>Reading: Students will read information sheets on various types of bonding and answer comprehension questions.</p> <p>Students will read an article on polymers and answer comprehension questions.</p> <p>Writing Students will write a comparison of the different types of bonding present in different compounds</p>	<p>Reading Students will read about particle model, density, SHC and latent heat</p> <p>Writing and talk Student will have to use writing and talk to describe and model the behaviour of particles in a substance to explain its density, they will have to explain the processes by which solids become liquids which become gases.</p>	<p>Reading: Students will read information on alpha, beta and gamma radiation and their applications in everyday life. They will grasp new vocabulary through this including ionising, penetrating, decay and half-life.</p> <p>Talk Students will discuss the situation regarding Alexander Litvinenko' death after poisoning with an alpha source.</p>	<p>Writing: Students will continue to write scientifically in their write up of required practical 15 and 16.</p>	<p>Writing: Students will continue to write scientifically in their write up of required practical 11- rates of reaction. This will specifically focus on forming hypotheses, identifying variables and presenting data.</p> <p>Writing Students will continue to write scientifically in their write up of required practical- electrolysis of an aqueous solution with</p>	<p>Talk Students will discuss the use of contraception and IVF. They will debate the ethical and economic implications of offering IVF on the NHS.</p>



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					<p>specific focus on forming hypothesis and predicting products formed.</p> <p>Talk</p> <p>Students will debate the costs to the human population of the extraction of metals and metal ores from the earth's crust.</p>	
TIER 3 VOCAB	<p>Bonding Metallic bonding delocalised ionic bonding covalent bonding properties melting point boiling point conductivity inter molecular forces</p> <p>Pathogen Microorganism Antiretroviral Phagocyte Vaccination</p>	<p>Respiration Anaerobic Endothermic Exothermic Aquatic Oxidation Oxygen debt Accumulated Metabolism</p>	<p>Radioactive, Ionising Nuclear equation Contamination Irradiation Half-life Decay</p>	<p>Alternating Oscilloscope Frequency Conductor Insulator Characteristics Transformer Efficiency</p>	<p>Activation Energy Reversible Dynamic Endothermic Exothermic Equilibrium Le Chatelier Mole Concentration Base Neutralisation Soluble Insoluble Salt</p> <p>Electrolysis Aqueous Anode Cathode</p>	<p>Regulation Homeostasis Optimal Stimulus Receptor Effector Response Reflex Neurone Endocrine Glands Diabetes Menstrual Plasmid Diabetes</p>
PSPSMC, BRITISH VALUES	<p>Social, Moral and Spiritual:</p> <p>Students will discuss blood diamonds and the reasoning behind their emergence and as a result</p>		<p>Social:</p> <p>Students will study the nuclear model of the atom and its development over time to the model we know and understand</p>	<p>Social and Moral:</p> <p>Students will learn about how electricity is generated from a variety of sources, both renewable and non-</p>	<p>Cultural</p> <p>Students will learn how reactions can be modified by a set of conditions which will allow the maximum amount of</p>	<p>Moral</p> <p>Students will learn how about IVF and will get an opportunity to discuss the ethic around keeping</p>



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	<p>the international certification of diamonds</p>		<p>now, they will be taught that much of this development took place in Manchester at the turn of the last century.</p> <p>The processes of radioactive decay and the uses and dangers of these materials will be studied. Classes will reference nuclear disasters including Chernobyl.</p>	<p>renewable and how demand is met to keep a stable supply for the country.</p>	<p>money to be made by industrial chemical companies especially when producing ammonia and fertilisers.</p> <p>Students will have a variety of opportunities to work partake in group work with their peers: practical experiments; discussions; debates; sharing ideas and group presentations.</p> <p>Students will look at the pro's and cons of the extraction of metals and metal ores on the environment and the costs, not only financial of these processes.</p>	<p>human embryos and destroying them.</p> <p>Social Pupils will learn about different types of contraception available. Additionally, they will learn about the pill and how women don't just take the pill as a contraceptive, but also to regulate their circle.</p>
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