Year 9 Combined Science and Separate Science Curriculum Map 2025-2026

Intent: We believe that students deserve a broad and ambitious Science curriculum that enriches in skill and knowledge, which ignites curiosity and prepares them well for future learning or employment. Our curriculum is sequenced to build upon prior knowledge learnt from KS1, KS2 and KS3 and firmly embed the precise learning points that pupils need to succeed in their qualification and also to go on to further career success.

Date	Topics	Knowledge and key skills	Assessment	Careers	SMSC	SRE/British Values	Virtues	Literacy
Autumn Term	Cells	Pupils will begin learning about prokaryotic and eukaryotic cells. They will recap plant and animal cells (parts and functions) from year 7 and compare these to a bacterial cell. They will also look at the different types of microscopes, when they are used and advantages and disadvantages of each. They will also use a microscope to calculate the real size of a cell. Pupils will then learn how cells divide by mitosis. They will begin to learn about the types of stem cells, their uses and advantages and disadvantages of these. Finally, pupils will look at how cells are involved in aerobic and anaerobic respiration. Triple pupils will also look at how microorganisms are grown aseptically and how we test the effectiveness of disinfectants. <u>Required Practical</u> - Using a light microscope(trilogy) - Osmosis((trilogy) Required practical - Effect of antibiotics on bacterial growth (Biology)	Knowledge Retrieval questions daily in lessons. EXIT tickets at the end of each topic. Marked by teacher. Pupils correct, teacher input and pupils given similar questions to demonstrate progress.	Possible career paths include; Lab technician, Pharmaceutical development, Biochemistry Medicine (Biology)	Social- How has an understanding of cells affected humankind? Moral- Is stem cell technology useful? Spiritual -Should we be able to control the genetics of your child?	SRE- Looking at when life begins and the rights of Scientists to be able to manipulate the human genome The Rule of Law about being able to experiment on humans. Tolerance – respecting other peoples' ethical beliefs	Moral- considering the ethics behind cell research	Subject specific terminology. Keywords <u>Cells 1</u> Eukaryotic cell Prokaryotic cell Mitochondria Chloroplasts Ribosomes Nucleus Partially permeable membrane <u>Cells 2</u> Cell cycle Differentiate Stem cells Therapeutic cloning Mitosis Meiosis Gamete Meristem Developing vocabulary speaking comprehension and writing in science
	Atomic Structure	Pupils will be introduced to the differences between atoms, elements, compounds and mixtures. The development of the scientific models of the atom including the relative electrical charges of subatomic particles. They will also look at the relative size and mass of atoms, their electronic structure and relative atomic mass.	Knowledge Retrieval questions daily in lessons. EXIT tickets at the end of each topic. Marked by teacher. Pupils correct, teacher input and pupils given similar questions to demonstrate progress.	Possible career paths include; Analytical Chemist Chemical Engineer Chemistry Teacher Forensic Scientist Geochemist Pharmacologist Medicine	Social- Looking at how evidence lead to changes in the models of the atom. Moral- The difficulties that scientists had accepting a new paradigm. Spiritual- Being aware of atoms being responsible for building everything.	Mutual respect – looking at the scientific method t and the importance of valuing other peoples' ideas and opinions in developing a theory	Civic considering the importance of the scientific method and changing views based on evidence	Subject specific terminology. Keywords Atom Molecule Element Compound Mixture Isotope The law of conservation of mass Developing vocabulary speaking

								comprehension and writing in science
	Particle Model	The particle model is widely used to predict the behaviour of solids, liquids and gases. Pupils will need to be able to calculate density for regular and irregular shaped objects, explain changes in state with reference to particles and internal energy, be able to calculate latent heat and explain the effects of temperature change on gas pressure.	Knowledge Retrieval questions daily in lessons. EXIT tickets at the end of each topic. Marked by teacher. Pupils correct, teacher input and pupils given similar questions to demonstrate progress.	**Possible careers** Hot air balloonist Submarine designer Metallurgist Geophysicist Academic researcher	Social- Pupils can work together to collect data during their required practical	Mutual respect Working together in a respectful way during the required practical	Performance presenting work and ideas to each other to describe the properties and structures of different compounds	<u>Subject specific terminology.</u> Keywords Density Chemical Change Chemical Change Physical Change Temperature Internal Energy Specific Heat Capacity Specific Latent heat of fusion Specific Latent Heat of vaporization Developing vocabulary speaking comprehension and writing in science
	Periodic Table	Students will learn about the historical development of the periodic table and atomic structure and how new scientific discoveries lead to the modern periodic table. Pupils will learn about the structured organisation of elements within the periodic table and the physical and chemical properties of elements in different groups. Comparison with Group 1 elements and transition metals CHEM only Typical properties of transition metals CHEM only	Knowledge Retrieval questions daily in lessons. EXIT tickets at the end of each topic. Marked by teacher. Pupils correct, teacher input and pupils given similar questions to demonstrate progress.	Possible career paths include; Chemist Chemical Engineer Environmental Chemist. Forensic Scientist.	Social- Role of Scientists sharing ideas and the scientific principal Moral- The obligation of Scientists to share ideas Spiritual Finding effective ways to communicate as scientists did when sharing periodic patterns Cultural – The impact of an improved understanding of chemical properties helped us to develop products which improved the quality of our lives.	Mutual respect and Tolerance to build on ideas to develop the periodic table	Civic- Considering the importance of sharing ideas and the scientific principal	

	Organisation 1 Digestion	Pupils will learn about the organs involved in the digestive system and how they all work together. They will explore what enzymes are and the role that they play in digestion. They will investigate the factors that effect enzyme action. They will also look at how we test for different food nutrients in our food. They will also learn how this process can be maximised for food production. <u>Required practical</u> • Food tests • Enzymes	Knowledge Retrieval questions daily in lessons. EXIT tickets at the end of each topic. Marked by teacher. Pupils correct, teacher input and pupils given similar questions to demonstrate progress.	Possible career paths include; Medical Doctor Nurse Chemical engineer Nutritionist Personal trainer	Social To explore what makes a balanced diet and consider the importance of a balanced diet Moral Should support be given to people in developing countries who are suffering from a lack of a balanced diet? Spiritual To consider if a balanced diet is all that is needed for a healthy person	Democracy making decisions with regards to lifestyle choices and availability of medical care to help those people with dietary and health issues.	Moral Intellectual Civic Performance	Subject specific terminology. Keywords Catalyst Enzyme Substrate Active Site Denature Metabolism Bile Developing vocabulary speaking comprehension and writing in science
	Structure and Bonding	Pupils will learn how the structure and bonding of matter affect their physical and chemical properties.	Knowledge Retrieval questions daily in lessons. EXIT tickets at the end of each topic. Marked by teacher. Pupils correct, teacher input and pupils given similar questions to demonstrate progress.	Possible career paths include; Chemist Chemical Engineer Environmental Chemist. Forensic Scientist Metallurgist	Social Pupils are to share ideas in their research on different structures Spiritual To be aware that the rearrangement of bonds of the same element can account for the differences between graphite and diamond.	Mutual respect in class listening to other pupils share ideas and contribute to the learning environment.	Performance presenting work and ideas to each other to describe the properties and structures of different compounds	Subject specific terminology. Keywords Covalent bond Ionic bond Intermolecular forces Polymer Delocalized electrons Fullerene Metallic bonding Alloy Developing vocabulary speaking comprehension and writing in science
	Separating Mixtures	A mixture consists of two or more elements or compounds not chemically combined together. The chemical properties of each substance in the mixture are unchanged. Mixtures can be separated by physical processes such as filtration, crystallisation, simple distillation, fractional distillation and chromatography. These physical processes do not involve chemical	Knowledge Retrieval and exit tickets	Chromatographer				Filtrate Filtration Chromatography Solvent Solute Condensation Evaporation

		reactions and no new substances are made. Students should be able to: • describe, explain and give examples of the specified processes of separation • suggest suitable separation and purification tec						
	Energy Stores	Pupils will learn about the concept of energy, with an emphasis on the law of conservation of energy and how energy can be both stored and transferred. Pupils will learn how energy can be generated and how to measure the efficiency of energy output in everyday appliances	Knowledge Retrieval questions daily in lessons. EXIT tickets at the end of each topic. Marked by teacher. Pupils correct, teacher input and pupils given similar questions to demonstrate progress.	Possible career paths include; Data Analyst. Engineer Lab Technician	Social/ Moral- Looking at the importance in reducing energy wastage for both a financial and environmental benefit. Spiritual- To be aware that all energy has existed since the Big Bang Billions of Yrs. ago and cannot be Created or destroyed.	Mutual Respect – looking at the importance of working together to look after the environment	Moral Considering the importance to the environment of conserving energy	Subject specific terminology. Keywords Energy Power Gravitational energy Kinetic energy Thermal energy Elastic energy Joule Efficiency Developing vocabulary speaking comprehension and writing in science
Summer	Organisation 2 The Heart	Pupils will then explore how the digested food is transported around the body. They will learn the structure of the heart, blood vessels and circulatory system. Finally, they will learn the causes and treatments of coronary heart disease	Knowledge Retrieval questions daily in lessons. EXIT tickets at the end of each topic. Marked by teacher. Pupils correct, teacher input and pupils given similar questions to demonstrate progress.	Possible career paths include; Medical Doctor Nurse Chemical engineer Nutritionist Personal trainer Physiotherapist	Social-Why have problems with disease like coronary heart disease increased over recent years? Moral -Should all people in one country be provided with equal health care?	British values Debate on the impact on lifestyle choices causing obesity and relate health conditions and the funding by the NHS to pay for treatments	Civic able to relate how lifestyle choices will affect fitness with regards to exercise and diet.	Subject specific terminology. Keywords Arteries Veins Capillaries Circulatory system Coronary heart disease Atrium Ventricles Aorta Vena Cava Pulmonary Developing vocabulary speaking comprehension and writing in science

	Energy and heat	Pupils will be introduced to the transfer of thermal energy to include Conduction, Convection and Infrared radiation (Physics) <u>Required practical –</u> • Specific heat capacity • Thermal insulation (Physics)	Knowledge Retrieval questions daily in lessons. EXIT tickets at the end of each topic. Marked by teacher. Pupils correct, teacher input and pupils given similar questions to demonstrate progress.	Possible career paths include; Heating technician/engineer Architect Environmental scientist	Social – To be aware of why we should thoroughly insulate our homes. Moral – Looking at the environmental benefits from insulation. Spiritual	Mutual Respect working together to conserve energy to become more environmentally conscience and to consider the issues that poorer members of society have meeting their own energy requirements	Performance working together with teamwork during the required practical	Subject specific terminology. Keywords Thermal conductivity Conductor Insulator Conduction Convection Specific Heat Capacity Developing vocabulary speaking comprehension and writing in science
	Quantitative and Reteach any gaps or for retrieval practice.	Chemists use quantitative analysis to determine the formulae of compounds and the equations for Reactions. **Separate Science ONLY titration; atom economy and percentage yeild**	**Knowledge Retrieval Questions** **EXIT Ticket for Quantitative -** Marked by teacher. Pupils correct, teacher input and pupils given similar questions to demonstrate progress.	**Chemists working in a lab.** **Pharmaceutical company**	Social- Working with others in a practical setting and realise they may have different ideas.	The rule of law- the right to health and safety	**Resilience** **Teamwork**	There is non subject terminology that pupils will need to understand to access and carry out the appropriate calculation. Yield, addition, multiple, ratio

	Bioenergetics	Explore how plants harness the Sun's energy in photosynthesis in order to make food. This process liberates oxygen which has built up over millions of years in the Earth's atmosphere. Both animals and plants use this oxygen to oxidise food in a process called aerobic respiration	Knowledge Retrieval- to test prior knowledge Exit ticket to test progress from the topic. Pupils should correct and make improvements from further teacher input.	Application in real life: Measure and calculate rate of reaction skill. Use data to relate limiting factors to the cost effectiveness of adding heat, light or carbon dioxide to greenhouses**.**	Spiritual- The ideas about plants went against the church at that time and for that reason many disagreed with the evidence Social- Working with others in a practical setting and realise they may have different ideas.	BV- Democracy- pupils learn to work in groups and accept other's views The rule of law- the right to health and safety	Wisdom, knowledge courage Resilience	Subject specific terminology. Keywords <u>Photosynthesis</u> Endothermic reaction Limiting factors Starch Glucose Aerobic respiration <u>Respiration</u> Exothermic reaction Glycogen Anaerobic respiration Lactic acid Oxygen debt Metabolism Developing vocabulary speaking comprehension and writing in science