	Chapter	Content	Knowledge	Skills	Key Questions	Assessment	Literacy/numeracy	SMSC
Autumn	В1	Cell Biology: Eukaryotic and Prokaryotic Cells Plant and Animal Cells Specialised Cells Transport across cells	Chapter B1 Knowledge: Knowing what cells look like under a light microscope and comparing what we can see under an electron microscope. Recailing the differences between plant and animal cells and learning how to organise cells into prokaryotes and eukaryotes. Learning how to calculate order of magnitude to appreciate size. Compare and contrast diffusion, osmosis and active transport.	Biology: To use a microscope to examine cells To be able to carry out calculations involving magnification, real size and image size To be able to calculate the order of magnitude and express answers in standard form Qualitatively test for the presence of different food molecules in a variety of foods	Biology: What are the differences between Eukaryotic and Prokaryotic Cells? How big are cells?	Diagnostic test on B1 ReACT tasks B1 End of Chapter Test	Biology: Key words: organelle, cell, diffusion, osmosis, active transport, microscope, membrane, specialised Numeracy: Calculating magnification and order of magnitude Key words: division, differentiation, somatic, meristem, cloning, tissue, organ, organ system, organism, carbohydrate, lipid, protein, digestion	Understand how microscopy techniques have changed over time and lead to recent developments. Working together to complete practicals safely.
	C1	Atomic Structure: Structure of the Atom Chemical Equations Separating Miktures Fractional Distillation and Chromatography History of the Atom Ions and Isotopes	Why atoms have no overall charge Understanding the differences between different atoms. Knowing how to calculate the number of different sub-atomic particles. Learning how to balance equations Appreciate how the model of the atom has evolved over time to lead to the modern atom. Knowing the differences between atoms and ions. Understanding how to separate different liquids by different methods.	Identifying different variables Confidence to carry out practicals Writing risk assessments. Recording data in a table. Evaluate the different models of the atoms and why they are replaced over time. Using SI Units and Standard form	How do different types of atoms differ from each other? How do Scientists carry out and document research?	C1 Diagnostics Test C1 End of Chapter Test C1 ReAct Tasks	Chemistry: Keywords: element, atom, groups, compounds, nucleus, electrons, reactants, products, equations, balanced, state symbols, solutions, aqueous, filtration, distillation, crystallisation, chromatography, atomic number, mass number, proton, neutron, ion, isotope, shells Numeracy: Balancing Equations, using standard form and calculation of number of subatomic particles.	Appreciating how the model of the atom has changed over time. Working together to complete practicals safely.
	P1	Conservation and Dissipation of Energy: Changes in Energy Stores Conservation of Energy Energy and Work Energy Dissipation Energy and Efficiency Electrical Appliances Energy and Power	Stating the forms energy can be stored in, explain how energy is transferred from one form to another, Understand the principle of conservation of energy and apply it to situations. Calculate efficiency in differing situations. Understand how to calculate amounts of energy, power and work done with units.	To recall and apply correct scientific knowledge To qualitatively be able to compare and contrast advantages and disadvantages of renewable and non-renewable energy resources	What are the different forms of energy store and transfer? What is the law of conservation of energy and how is tapplied? What is efficiency and how can you find the efficiency of a device? How do power and energy telate?	Diagnostic test on P1 ReACT tasks P1 End of Chapter Test	Key words: Energy Store, Work done, Spring Constant, Gravitational Potential Energy, Kinetic Energy, Dissipated, Efficiency Numeracy: Calculating percentages, drawing and interpreting graphs and using equations.	Appreciating how the model of the atom has changed over time. Working together to complete practicals safely.
Spring	B2	Cell differentiation and specialisation: The Cell Cycle Cell division Cell differentiation Stem cells Therapeutic cloning	Knowing the importance of cell differentiation. Describe mitosis and why it is important in cells. Evaluate the use of stem cells. Know the process of therapeutic cloning.	Nodelling cell division Evaluate the use of embryonic vs. Adult stem cells and create a well balanced argument. Qualitatively test for the presence of different food molecules in a variety of foods	Why do cells divide? How can stem cells be used in human medicine?	Diagnostic test on B2 ReACT tasks B2 End of Chapter Test	Key words: division, differentiation, somatic, meristem, cloning, tissue, organ, organ system, organism, carbohydrate, lipid, protein, digestion Numeracy: Interpreting data and graphs, calculating percentage, drawing graphs	
	C2	The periodic Table Content: Development of periodic Table Electronic Structures and the Periodic table. Group 1 Group 7	How the periodic table developed over time. How testing a prediction can support or refute new scientific ideas. How atomic structure is linked to the periodic table. How elements behave in different groups and how these properties change as we go down the group The difference between transition metals and alkali metals.	Evaluate the different models of the periodic table. Linking the properties of different atoms to their position on the periodic table. Writing balanced equations	Why was the periodic table such a significant science breakthrough?	C2 Diagnostic Test C2 End of Chapter Test C2 ReAct Tasks.	Keywords - Alkali, pH, universal indicator, halogens, displacement, transition, properties. Numeracy: Balancing equations	Understanding why the periodic table came about. Understanding why the periodic table was a scientific breakthrough.
	P2	Energy Transfers: Conduction Infrared Radiation Specific Heat Capacity Heating and Insulating Buildings	Required Practical: Investigating Thermal Insulators Define infrared radiation and thermal conductivity. Explain what specific Heat capacity and how it be calculated by callcuation or via a practical. Describe how heat is lost through a home and how this can be prevented	To be able to use and read a thermometer correctly To be able to use a stopwatch accurately and effectively To be able to record scientific data accurately in a table To use an equation- in this case the specific heat equation. When doing this to use correct units and make conversions if required To memories stores and transfers of energy and interpret how energy has been converted in an interaction. To memories and be able to apply one of three equations taught in the chapter. To be able to rearrange one of the equations used in class and then calculate a property.	What is conduction? Where does it occur? What is infrared, how is the transfer of energy by this method useful? How can heat transfer be reduced or increased?	Diagnostic test on P2 ReACT tasks P2 End of Chapter Test	Key words: Thermal conductivity, Infrared Radiation, Specific Heat Capacity, Numeracy: Calculating specific heat capacity, interpreting data, using equations and drawing graphs	Understanding the importance of insulation oh houses.
	P3	Energy Resources: Energy Demands Renewable Resources Non-Renewable Resources Energy and the Environment	Describe how energy demands change throughout the day and how these needs can be met. Name types of renewable and non-renewable energy and when their use is appropriate. Describe the energy transfers within each.	To memorise stores and transfers of energy and interpret how energy has been converted in an interaction.	What are non renewable energy resources? How are they utilised? Why has their use become unsustainable? What are the alternatives to non- renewable energy and what are the pros and cons of each method? How can we use the above resources to meet demand?	Diagnostic test on P3 ReACT tasks P3 End of Chapter Test	Key words: Biofuel, carbon-neutral, reactor core, geothermal energy, renewable, non-renewable, Nuclear fuel Numeracy: interpreting data, using equations and drawing graphs	Appreciate the importance of renewable energy.

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Summer	В3	Organisation and the Digestive System: Tissues and organs The human digestive system The chemistry of food Catalysts and Enzymes Factors affecting enzymes How the digestive system works Efficient Digestion	Outline the hierarchy in cells: cells, tissues, organs, organ systems, and organism. Recall the organs of the human digestive system. Know the basic structure of proteins, carbohydrafes and lipids. Describe how enzymes work in the digestive system. Explain how the small intestine is adapted for efficient digestion. Describe how old bill. Explain how temperature and pH affect enzyme structure and action. Describe what happens when an enzyme becomes denatured.	Food tests The effect of temperature on the rate of reaction of amylase	What are enzymes? What factors affect how an enzyme works? Where are enzymes found? Why is the digestive system important? What is in our food?	Diagnostic test on B3 ReACT tasks B3 End of Chapter Test	Key words: enzyme, active site, substrate, small intestine, villi, bile, denature, temperature, pH, Numeracy: Interpreting data and graphs, drawing graphs, calculating percentage, drawing graphs	Understand how the body functions. Working together to complete the practical safely.	
	C3/C5	C3:Structure and Bonding States of Matter Atoms into Ions Ionic Bonding C5: Chemical Changes Displacement reactions Extracting Metals Salts from metals and bases Reactivity Series	Predicting the states of substances at different temperatures. How atoms can form ions. Know how some common metals react with water How to write ionic displacement reactions Identify which substances have been oxidised or reduced Predicting products from their reactants Deducing the formulae of common salts	Required Practicals Making Copper Salts Making Copper Salts Making a salt from a metal carbonate Appreciate the limitations of the particle theory and structure models Linking of group number to charge number Identification of different ongrounds from diagrams Deduce reactivity of metals from experimental data Predict reactions of unfamiliar metals when given information of their reactivity Identifying which chemicals have been oxidised or reduced in an ionic equation Evaluate processes used to extract different metal Predict products from their reactants Preparing a salt safely from its reactants	How do atoms bond to each other? How can we extract metals from their ores?	C3/C5 Diagnostics Test C3/C5 End of Chapter Test C3/C5 ReAct Task	Numeracy: Writing Ionic formulae, Calculating charges on ions, Surface area to volume ratio, Balancing equations, Measuring and weight saits and relating pH value to H+ concentrations. Keywords: solids, liquids, gases, particle theory, covalent, ionic, metallic, bonding, lattice, polymers, intermolecular, delocalised, fullerenes, alloys, nano, ores, oxidiaed, reduced, reactivity series, displacement, ionic, electrolysis, neutralisation, alkalis, bases, neutral, pH scale, strong acids, weak acids	Will mining the metal ore impact our environment? How could we extract metals sustainably?	
	В4	Organising Animals and Plants: The heart Artificial Pacemakers and Stents Breathing and Gas Exchange The blood Blood vessels	Outline the structure of the heart. Label the atrium and ventricles. Know where the valves are found in the heart and their role. Describe how blood travels in the heart. Discuss the need for an artificial heart or a stent implant. Describe the components of the blood and how it travels around the body. Describe structural differences in arteries, veins, and capillaries.	Required Practical: Dissect a mammalian heart and locate the atria, ventricals, heartstrings, valves, coronary atteries. Model inhalation and exhalation using a Bell Jar Qualitatively test how different temperatures affect the rate of reaction in enzymes Interpret graphs showing enzyme rate of reaction Calculate the rate of reaction of an enzyme	What is blood? How does blood travels around the body and what does it carry? How does the heart pump blood around the body? Why might someone need a stent implant?	Diagnostic test on B4 ReACT tasks B4 End of Chapter Test	Key words: platelets, plasma, arteries, veins, capillaries, atria, ventricle, valve, double circulatory system, pacemaker, stent, statins, platelets, plasma, arteries, veins, capillaries Numeracy: Interpreting data and graphs, drawing graphs, calculating percentage, drawing graphs	Understand how the body functions. Working together to complete the practical safety.	
Enrichment opportunities and futures			Visiting Body World's exhibition in Leicester square- Get up close to real bodies and examine their organs and systems Investigate how enzymes are used in industry (ie. Washing detergent, foods etc) Visit the Science Museum in South Kensington- They have a section that looks at organs and medicine PHYSICS A visit to the following would be excellent: Science Museum, the National Space Centre, Royal observatory museum and Brunel Museum The following documentaries are recommended for year 1: any documentary by Jim Al-Khalilii or Green Planet to add context to topic P3- non-renewable resources STEM Club Visiting Science Museum - There is a specific section for Chemistry on their website Watching the Royal Institute Lectures on Youtube Visiting the Royal Institute Lectures on Youtube Visiting the Summer Fayre at the Royal Society of Chemistry Research the link between Chemistry and Food. How can we use Chemistry to make different sweets?						

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