Activate 2 (Year 8)		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 8	**Topic**	**Biology - Health and Lifestyle (B1)** **Chemistry - The Periodic Table (C1)**	**Biology - Ecosystem Processes (B2)** **Physics - Energy (P2)**	**Chemistry – Chemical Reactions (C2)** **Physics - Electricity and Magnetism (P1)**	**Physics - Pressure (P3)** **Science Week Project**	**Biology: Adaptation and Inheritance (B3)** **Chemistry - Metals & Acids (C3)**	**Biology- Immune Response (B4)** **Chemistry - The Earth (C4)**
	Big questions	**B1** How does your body exchange gases with the environment? How can drugs affect your body? How does your body break down the food you eat? **C1** What are atoms and elements? What are the patterns in properties of elements? How can we use the periodic table to predict element properties?	**B2** How does the body transfer energy from food by respiration? What is the difference between aerobic and anaerobic respiration? How do plants make food? **P2** What happens in terms of energy when you are watching tele or charging you phone? How can we reduce energy bills?	**C2** What happens in chemical reactions? How does mass change in chemical reactions? Why do chemical reactions transfer energy? **P1** What happens in an electric circuit? What happens in a power station?	**P3** How can we calculate and represent the motion of an object? How does pressure act in solids, liquids and gases? How do forces cause objects to turn? **Project week** What skills and techniques does a forensic scientist use? How do scientists use evidence to solve crimes?	**B3** Why do we all not look the same? How do you inherit characteristics from your parents? What is the likelihood of you inheriting a characteristic? **C3** What are chemical reactions? What are the patterns in reactions of metals? What are the patterns in reactions of acids?	**B4** What are communicable diseases and how do you prevent them? How can lifestyle increase or decrease risk of disease? How does vaccination protect you against disease? **C4** What causes climate change? How do we obtain materials? How can we conserve Earth's resources?
	Prerequisite knowledge	**Topics:** Cells and specialised cells; levels of organisation; gas exchange; nutrients and healthy diets; particles and states of matter; atoms, elements and compounds; symbols and formulae; metals and non-metals. **Skills:** Planning fair tests; identifying variables; using laboratory equipment safely; measuring accurately; recording results; drawing graphs; identifying patterns and writing conclusions.	**Topics:** Plant and animal cells; gas exchange; nutrients and digestion; plant reproduction; food chains and interdependence; particles and changes of state; forces, movement, light, sound and simple circuits. **Skills:** Using word equations and models; measuring temperature, time, mass and volume; calculating differences and rates; plotting graphs; identifying relationships, anomalies and evidence-based conclusions.	**Topics:** Particles; atoms, elements and compounds; the periodic table; physical and chemical changes; word equations; acids and alkalis; simple circuits; conductors, insulators and magnetic forces. **Skills:** Using particle diagrams and word equations; identifying reactants and products; measuring mass and temperature; constructing and drawing circuits; planning investigations; interpreting tables, graphs and observations.	**Topics:** Contact and non-contact forces; balanced and unbalanced forces; friction, drag and gravity; energy transfers; particles in solids, liquids and gases; density; levers and material properties. **Skills:** Measuring distance, time, force and area; converting units; using equations; calculating averages; plotting and interpreting graphs; planning valid investigations; analysing and evaluating evidence. based on evidence.	**Topics:** Cells and nuclei; reproduction and fertilisation; variation and classification; habitats, food webs, photosynthesis and respiration; the periodic table; metals and non-metals; reactions, acids and alkalis. **Skills:** Using biological models; classifying; identifying patterns; using simple probability; comparing data; writing word equations; measuring pH; presenting results and making predictions.	**Topics:** Cells, microorganisms and body systems; health and lifestyle; variation and inheritance; photosynthesis, respiration and food webs; elements and reactions; metals and materials; energy resources; rocks, the Earth and atmosphere. **Skills:** Interpreting health and environmental data; calculating percentages and risk; distinguishing correlation from causation; identifying trends and anomalies; evaluating evidence; comparing benefits and drawbacks.
	Domains of knowledge	Health and Disease Chemical Changes	Interdependence Energy	Chemical reactions and enthalpy Electricity and magnetism	Forces and motion Energy	Inheritance Evolution Chemical Changes	Pathogens, Immunity, vaccination, Earth, Atmosphere and Resources Human Impact

	Concepts	**B1** 1. Nutrients 2. Food tests 3. Unhealthy diet 4. Digestive system 5. Biotechnology 6. Smoking 7. Drugs 8. Alcohol 9. Breathing **C1** 1. Atoms, elements, compounds 2. Atomic and electronic structure 3. Metals and non-metals 4. Groups and periods 5. Elements of group 1, 7 & 0 10. Writing chemical formula 11. Atoms in chemical reactions 12. Polymers	**B2** 1. Aerobic respiration 2. Anaerobic respiration 3. Biotechnology: fermentation 4. Photosynthesis 5. Leaves 6. Plant Nutrition 7. Food and fuel + BMI **P1** 1. Work energy and machines 2. Non-renewable energy 3. Renewable energy 4. Energy and power 5. Energy adds up 6. Energy Dissipation 7. Energy stores + Transfer 8. Energy and Temperature 9. Energy Transfer: Particles 10. Energy Transfer: radiation	**C2** 1. Atoms in chemical reactions 2. Combustion 3. Thermal decomposition 4. Conversation of Mass 5. Exothermic reactions 6. Endothermic reactions 7. Energy level diagrams 8. Solutions and concentrations **P1** 1. Charging Up 2. Introduction to circuits 3. Conductors and insulators 4. Series and parallel circuits 5. Potential difference 6. Resistance 7. Magnets and magnetic fields 8. Using Electromagnets	**P3** 1. Pressure in gases 2. Pressure in liquids 3. Pressure on solids **Project week** 1. Crime scene observation 2. Hair and fibre microscopy 3. Chromatography 4. Fingerprint analysis 5. Scale and magnification 6. DNA extraction	**B3** 1. Competition and adaptation 2. Variation 3. Natural selection 4. Inheritance 5. Genetic diagrams 6. Preserving biodiversity 7. Extinction 8. DNA 9. Genetic modification 10. Charles Darwin **C3** 1. Metals and non-metals recap 2. Reactions of metals & nonmetals. 3. Reactions and metals and acid 4. Collison theory & rate of reaction 5. Measuring Rate of reaction 6. Gas test 7. Metals and oxygen 8. Metal displacement reactions 9. Extracting metals from ores	**B4** 1. Health and Disease 2. Pathogens and Disease 3. Preventing Diseases 4. Human Defence Response 5. Vaccines 6. Antibodies and painkillers 7. Non- Communicable Disease **C4** 1. History of the earth's atmosphere 2. Greenhouse gases 3. Carbon cycle 4. Climate change 5. Cleaning up exhaust 6. Energy demands
	Skills	To test foods for: non-reducing sugars, proteins and fats. Measure the amount of energy stored in food. Conduct practical chemistry safely and accurately.	Measure the amount of energy stored in food.	Conduct practical chemistry safely and accurately Preparation of electrical circuits which allow for appliances to function.	Conduct practical physics safely and accurately Use analytical techniques to process evidence.	Use literacy skills in order to communicate scientific ideas effectively. Conduct practical chemistry safely and accurately.	Conduct practical chemistry safely and accurately.
	Impact/Assessment	End of Unit assessment to assess impact. **(40 minutes)**	Year 8 exam week **(1 hour under formal exam conditions)**	End of Unit assessment to assess impact. **(40 minutes)**	End of Unit assessment to assess impact. **(40 minutes)**	End of Unit assessment to assess impact. **(40 minutes)**	End of Unit assessment to assess impact. **(40 minutes)**
	Tier 3 Vocabulary (literacy in science)	Balanced diet, Deficiency, Villi, Enzymes, Withdrawal symptoms, Proteins, Carbohydrates, Vitamins, Lipids, Fibre Metals, Non-metals, Periodic table, Groups, Periods, Reactive, Displacement, Unreactive, Density	Producers, Consumers, Photosynthesis, Stomata, Bioaccumulation, Fertilisers, Aerobic respiration, Anaerobic respiration Kinetic, Electricity, Gravitational, potential, chemical, thermal, nuclear, efficiency, Power, Light	Current, Voltage, ammeter, voltmeter, cell, electron, charge, Series circuit, Parallel circuits, Components Chemical reaction, reactants, products, conservation of mass, exothermic, endothermic, combustion, oxidation, thermal decomposition, acid, alkali, neutralisation, salt, indicator, and pH scale	Pressure, Gradient, Acceleration, Stationary, Bombardment, Collision.	Continuous variation, Discontinuous variation, Inherited, Environmental, Chromosomes, Genes, DNA	Pathogen, bacteria, virus, fungi, microorganism, infection, white blood cell, phagocyte, lymphocyte, antigen, antibody, immune response, vaccination, immunity, vaccine, memory cells, antitoxin, incubation period, contagious, herd immunity. Atmosphere, Climate change, Recycling
	Supporting learning at home	Century, Kerboodle, satchel and Knowledge Organisers	Century, Kerboodle, satchel and Knowledge Organisers	Century, Kerboodle, satchel and Knowledge Organisers	Century, Kerboodle, satchel and Knowledge Organisers	Century, Kerboodle, satchel and Knowledge Organisers	Century, Kerboodle, satchel and Knowledge Organisers
	Wider learning and British Values (addressing inequalities)	*Institute of Physics, Royal Society of Chemistry, Royal Society of Biology, BBC Bitesize Revision and STEM*	*Institute of Physics, Royal Society of Chemistry, Royal Society of Biology, BBC Bitesize Revision and STEM*	*Institute of Physics, Royal Society of Chemistry, Royal Society of Biology, BBC Bitesize Revision and STEM*	*Institute of Physics, Royal Society of Chemistry, Royal Society of Biology, BBC Bitesize Revision and STEM*	*Institute of Physics, Royal Society of Chemistry, Royal Society of Biology, BBC Bitesize Revision and STEM*	*Institute of Physics, Royal Society of Chemistry, Royal Society of Biology, BBC Bitesize Revision and STEM*
	Careers	***B1 Health and Lifestyle:*** *Dietitian, nurse, doctor, dental nurse, health promotion specialist*	***B2 Ecosystem Processes:*** *Ecologist, environmental scientist, conservationist, wildlife biologist,*	***C2 Chemical Reactions:*** *Chemist, pharmacist, chemical engineer, forensic scientist,*	***P3 Motion and Pressure:*** *Mechanical engineer, automotive engineer, aerospace engineer,*	***B3 Adaptation and Inheritance:*** *Geneticist, biomedical scientist, clinical geneticist, genetic*	***B4 Immune Response:*** *Immunologist, microbiologist, biomedical scientist, infectious*

		C1 Periodic Table: *Laboratory analyst, analytical chemist, polymer chemist, materials scientist, hazardous waste chemist, chemistry teacher*	*marine biologist, environmental consultant* ***P2 Energy:*** *Renewable energy engineer, energy consultant, mechanical engineer, renewable energy technician, nuclear technician, energy research scientist*	*laboratory technician, quality control analyst* ***P1 Electricity and Magnetism:*** *Electrician, electrical engineer, electronics engineer, medical physicist, power systems engineer, renewable energy engineer*	*meteorologist, materials engineer, driving instructor* ***Science Week Project:*** *Forensic scientist, crime scene investigator, forensic chemist, toxicologist, fingerprint examiner, laboratory technician*	*counsellor, evolutionary biologist, conservation scientist* ***C3 Metals and Acids:*** *Metallurgist, materials scientist, chemical engineer, corrosion engineer, analytical chemist, chemistry teacher*	*disease doctor, epidemiologist, vaccine researcher* ***C4 The Earth:*** *Geologist, climate scientist, environmental engineer, meteorologist, mining engineer, materials scientist*