Long Term Plan Science Year 10

GCSE Focus	Topic	Week	Learning Outcomes
Basic Practical Skills	Basic Practical Skills	1-3	• Follow a written method • Recording and Analysing Results • Plotting Graphs • Drawing Conclusions
P1: GPE and KE	GPE and KE	4	• Describe how energy is stored and transferred in objects moving and changing shape. • Explain the relationship between gravitational potential, kinetic, and elastic potential energy. • Apply calculations to problems involving energy conservation and transfers.
C4: Acids and Bases	Acids and Bases	5	• Describe what acids and alkalis are and how they react. • Explain the process of neutralisation and its applications. • Predict products and write word equations for acid-base reactions.
B4:Photosynthesis	B4:Photosynthesis	6	• State the word and symbol equations for photosynthesis. • Explain how light, carbon dioxide, and temperature affect photosynthesis. • Interpret data to analyse limiting factors in photosynthesis.
P1: Elastic Potential Energy	Elastic Potential Energy	7	• Describe how energy is stored and transferred in objects moving and changing shape. • Explain the relationship between gravitational potential, kinetic, and elastic potential energy. • Apply calculations to problems involving energy conservation and transfers.
C4: Electrolysis	Electrolysis	8	• Describe what electrolysis is and the equipment used. • Explain how ions move and what products are formed at electrodes. • Predict the products of electrolysis for given solutions and compounds.
Review: Students spent week 8 completing catchup work and exam questions. This was required due to gaps in student work. Students will start C4: Electrolysis Table during week 9 after October half term.			
B4: Respiration	Respiration	9	• State the word and symbol equations for aerobic respiration. • Compare aerobic and anaerobic respiration in terms of products and energy yield. • Explain the role of respiration in supplying energy for metabolic processes.
P1:Reducing Unwanted Energy Transfers	Reducing Unwanted Energy Transfers	10	• Describe how insulation reduces unwanted energy transfers. • Explain how lubrication reduces energy dissipation due to friction. • Evaluate methods used to improve energy efficiency in different contexts.
C4: Extraction of Metals-Electrolysis	Extraction of Metals-Electrolysis	11	• Describe what electrolysis is and the equipment used. • Explain how ions move and what products are formed at electrodes.

			• Predict the products of electrolysis for given solutions and compounds.
B5: Homeostasis	Homeostasis	12	• Define homeostasis and explain its importance for maintaining internal conditions. • Describe the roles of receptors, coordination centres, and effectors in homeostasis. • Explain how negative feedback helps maintain stable internal environments.
P1: Renewable and Non-Renewable Energy	Renewable and Non-Renewable Energy	13	• Describe the differences between renewable and non-renewable energy resources. • Evaluate the environmental impacts and reliability of different energy resources. • Interpret data to compare the effectiveness of various energy sources.
C5: Exothermic and Endothermic Reactions	Exothermic and Endothermic Reactions	14	• Describe the difference between exothermic and endothermic reactions. • Interpret reaction profile diagrams for exothermic and endothermic reactions. • Explain how bond breaking and bond making relate to energy changes.
B5: Nervous System	Nervous System	15	• Describe the structure and function of the central nervous system. • Explain how information is transmitted via neurons and synapses. • Describe how the body responds to stimuli through coordinated responses.
P2: Circuit Basics	Circuit Basics	16	• Describe the components of a simple circuit and their functions. • Use circuit symbols to represent and interpret circuit diagrams. • Apply the relationship between charge, current, and time in calculations.
C5: Reaction Profiles	Reaction Profiles	17	• Interpret and draw reaction profile diagrams for chemical reactions. • Explain activation energy and the role of catalysts. • Relate reaction profiles to exothermic and endothermic processes.
B5: Reflexes Required Practical	Reflexes Required Practical	18	• Describe the reflex arc and its role in rapid responses. • Plan and carry out a practical to investigate reaction time. • Analyse data to evaluate factors affecting human reaction times.
P2: Series and Parallel Circuits	Series and Parallel Circuits	19	• Compare current and potential difference in series and parallel circuits. • Construct and interpret series and parallel circuit diagrams. • Calculate total resistance in series and parallel circuits.
C6: Rates of Reaction	Rates of Reaction	20	• Describe the factors affecting the rate of a chemical reaction. • Interpret data from experiments measuring rates of reaction. • Explain the effect of surface area, temperature, concentration, and catalysts on reaction rate.
B5: Control of Blood Glucose	Control of Blood Glucose	21	• Describe how blood glucose levels are regulated by insulin and glucagon. • Explain the roles of the pancreas and liver in blood glucose control.

			• Interpret data showing changes in blood glucose concentration.
P2: Resistance of a Wire	Resistance of a Wire	22	• Describe the factors affecting resistance in a conductor. • Plan and carry out an investigation into how length affects resistance. • Analyse and interpret data to draw conclusions about resistance.
C6: Catalysts	Catalysts	23	• Define a catalyst and explain how it affects the rate of reaction. • Describe how catalysts work without being used up. • Evaluate the uses of catalysts in industry.
B5: Diabetes	Diabetes	24	• Describe the causes and symptoms of Type 1 and Type 2 diabetes. • Explain how diabetes is managed and treated. • Evaluate lifestyle choices that influence the risk of developing diabetes.
P2: I-V Characteristics	I-V Characteristics	25	• Describe how current varies with potential difference for different components. • Plot and interpret I-V characteristic graphs. • Explain the behaviour of ohmic and non-ohmic conductors.
C7: Alkanes and Alkenes	Alkanes and Alkenes	26	• Describe the structure and properties of alkanes and alkenes. • Compare saturated and unsaturated hydrocarbons. • Explain the reactions of alkenes, including addition reactions.
B5 / B6: Human Reproduction	Human Reproduction	27	• Describe the structure and function of the human reproductive systems. • Explain the roles of hormones in the menstrual cycle and reproduction. • Outline the process of fertilisation and embryo development.
P2: Wiring a Plug	Wiring a Plug	28	• Identify the function of the live, neutral, and earth wires in a plug. • Describe how to wire a plug safely. • Explain the importance of insulation, fuses, and circuit breakers.
C7: Crude Oil and Fractional Distillation	Crude Oil and Fractional Distillation	29	• Describe how crude oil is formed and its composition. • Explain how fractional distillation separates hydrocarbons by boiling point. • Describe the uses of different fractions and their economic importance.
B5: Contraception	Contraception	30	• Describe different methods of contraception. • Explain how hormonal and non-hormonal methods prevent pregnancy. • Evaluate the effectiveness and ethical issues of contraception methods.
P5: Weight and Gravity	Weight and Gravity	31	• Define weight and mass and describe the relationship between them. • Use the equation W = mg to solve problems. • Explain how gravitational field strength varies on different planets.
C8: Chromatography	Chromatography	32	• Describe how chromatography separates mixtures. • • Analyse chromatograms to identify unknown substances.

B6: DNA	DNA	33	• Describe the structure of DNA as a double helix. • Explain how DNA carries genetic information. • Link DNA structure to protein synthesis and inheritance.
P5: Springs and Hooke's Law	Springs and Hooke's Law	34	• Describe the relationship between force and extension for a spring. • Use Hooke's Law (F = kx) to solve problems. • Interpret data from experiments investigating spring extension.
C8: Gas Tests	Gas Tests	35	• Describe the standard laboratory tests for common gases. • Explain how test results link to the properties of gases. • Apply knowledge of gas tests to experimental contexts.
B6: Inheritance	Inheritance	36	• Describe the difference between sexual and asexual reproduction. • Explain how characteristics are inherited through alleles. • Predict outcomes of genetic crosses using Punnett squares.
P5: Newton's Laws	Newton's Laws	37	• State Newton's three laws of motion. • Explain how Newton's laws apply to moving objects. • Apply Newton's laws to solve motion problems.
C9: Evolution of the Earth's Atmosphere	Evolution of the Earth's Atmosphere	38	• Describe how Earth's atmosphere has changed from its early formation to what it is today. • Explain how volcanic activity, oceans, plants, and photosynthesis changed the levels of gases like carbon dioxide and oxygen. • Use evidence (like rocks, fossils, and ice cores) to support ideas about how and why the atmosphere has evolved over time.
B6: Selective Breeding	Selective Breeding	39	• Describe what selective breeding is and give examples. • Explain how selective breeding produces desirable traits. • Evaluate risks and benefits of selective breeding in agriculture.