Long Term Plan Science Year 9

GCSE Focus	Topic	Week	Learning
Practical Skills	How Science Works	1-4	• Following a written method • Recording and Analysing Results • Plotting Graphs • Drawing Conclusions
C1: Atomic Structure	Atoms and the Periodic Table	5	• State the relative mass and charge of subatomic •particles. • Draw a labelled diagram of an atom. • Determine the number of each subatomic •particle in an atom.
B1: Plant Cells and Microscopy	Plant and Animal Cells	6	• Required Practical 1: Microscopy • Label diagrams of plant and animal cells. • Compare plant and animal cells.
Practical Skills	Measuring time with pendulums	7	• Following a written method • Recording and Analysing Results • Plotting Graphs • Drawing Conclusions
C1: Periodic Table	Mendeleev and Development of the Periodic Table	8	• State the layout of the periodic table. • Describe the key steps in developing the periodic table. • Explain why the periodic table has changed over time.
Review: Students spent week 8 completing catchup work and exam questions. This was required due to gaps in student work. Students will start C1: Periodic Table during week 9 after October half term.			
B1: Animal Cells and Specialised Cells	Types of Cells	9	• Describe the structure and function of animal cells. • Explain how specialised cells are adapted to their functions. • Compare the roles of different specialised cells in multicellular organisms.
Basic Practical Skills: Speed Calculations	Ramps Practical	10	• Following a written method • Recording and Analysing Results • Plotting Graphs • Drawing Conclusions
C1: Group 1, 7 and 0	Alkali Metals, Halogens and Unreactive Metals	11	• Describe the properties and trends of Group 1, 7, and 0 elements. • Explain how reactivity changes within these groups and why. • Predict the reactions of these elements based on their position in the periodic table.
B1: Mitosis and Meiosis	Cell Division	12	• Describe the stages of mitosis and meiosis. • Explain the importance of mitosis in growth and repair, and meiosis in reproduction. • Compare the outcomes of mitosis and meiosis.
P3: Changes of State	Changing State	13	• Describe changes of state in terms of particle movement. • Explain how energy changes during changes of state. • Interpret heating and cooling graphs showing changes of state.

C1: Separating Mixtures	Filtration Practical	14	• Describe methods of separating mixtures such as filtration and distillation. • Explain why different separation techniques are used for different mixtures. • Evaluate separation methods based on particle properties and boiling points.
B2: Organisation	Cells, Tissues, Organs and Organ Systems	15	• Describe how cells are organised into tissues, organs, and organ systems. • Explain how organ systems work together to carry out life processes. • Analyse examples of how structure relates to function in body systems.
P3: Density	Measuring Density Practical	16	• Define density and describe how to measure it for solids and liquids. • Explain why materials have different densities. • Solve problems involving density calculations.
C1: Chromatography	Paper Chromatography Practical	17	• Describe the process of paper chromatography. • Explain how chromatography separates substances based on solubility. • Interpret chromatograms to identify components in a mixture.
B2: Heart and Lungs	Heart Dissection	18	• Identify the main structures of the heart and lungs. • Explain how the heart and lungs work together in the circulatory system. • Analyse how structure relates to function in the cardiovascular and respiratory systems.
P3: Specific Heat Capacity	Measuring Specific Heat Capacity	19	• Define specific heat capacity and describe how it is measured. • Explain why different materials have different specific heat capacities. • Calculate energy changes using the specific heat capacity formula.
C2: Ionic and Covalent Bonding	Bonding Diagrams	20	• Describe how ionic and covalent bonds form. • Draw and interpret diagrams representing ionic and covalent bonding. • Predict the properties of substances from their bonding type.
B3: Blood Vessels	Circulatory System	21	• Describe the structure and function of arteries, veins, and capillaries. • Explain how blood vessels are adapted to their roles in the circulatory system. • Analyse how the structure of blood vessels supports efficient blood flow.
P4: Models of the Atom	Plum Pudding and Atomic Model of the Atom	22	• Describe the key models of the atom and how they developed over time. • Explain how experimental evidence led to changes in the atomic model. • Compare different atomic models and their limitations.
C2: Giant Structures	Giant Ionic and Covalent Structures	23	• Describe the structure and bonding in giant ionic and covalent substances. • Explain how bonding affects properties such as melting point and conductivity. • Relate the properties of giant structures to their uses.

B3: Non-Communicable Diseases	Effects of Alcohol, Smoking and Poor Diet	24	• Describe the effects of lifestyle choices on health. • Explain how alcohol, smoking, and diet contribute to non-communicable diseases. • Evaluate the impact of lifestyle changes on reducing disease risk.
P4: Isotopes	Radioactive Elements	25	• Define isotopes and describe their properties. • Explain how isotopes are used in scientific and medical applications. • Compare the stability and uses of different isotopes.
C2: Polymers	Polymerisation, Properties and Examples of Polymers	26	• Describe how polymers are formed through polymerisation. • Explain how polymer properties are linked to their structure. • Evaluate the uses and environmental impacts of polymers.
B4: Photosynthesis	Photosynthesis Equation	27	• State the word and symbol equations for photosynthesis. • Explain how light intensity, carbon dioxide, and temperature affect photosynthesis. • Analyse data to interpret the limiting factors of photosynthesis.
P4: Half Life	Random Nature of Radioactivity	28	• Define half-life and describe how it is measured. • Explain the random nature of radioactive decay. • Interpret decay curves and use them to calculate half-life.
C2: Structures of Carbon	Carbon Allotropes	29	• Describe the structures of diamond, graphite, and graphene. • Explain how bonding affects their properties and uses. • Compare the properties of different carbon allotropes.
B4: Aerobic and Anaerobic Respiration	Types and Products of Respiration	30	• Describe the processes of aerobic and anaerobic respiration. • Explain the differences in energy yield and products. • Compare the conditions under which each type of respiration occurs.
P4: Contamination and Risk	Risks associated with Radioactivity	31	• Describe potential hazards of radiation exposure. • Explain how contamination and irradiation differ. • Evaluate methods for reducing radiation risks.
C3: Conservation of Mass	Products of Reactions	32	• State the law of conservation of mass. • Explain how mass is conserved during chemical reactions. • Use balanced equations to show conservation of mass.
B4: Effects of Exercise	Effect of Exercise on the Body	33	• Describe how the body responds to exercise. • Explain why heart rate and breathing rate change during exercise. • Analyse how regular exercise affects health and fitness.
P4: Contamination Case Study	Chernobyl Case Study	34	• Describe what happened during the Chernobyl disaster. • Explain the short- and long-term effects of radiation exposure.

			• Evaluate the safety measures and lessons learned from the case study.
C4: Metal Oxides	Common Metal Oxides and their Properties	35	• Describe how metal oxides form and their general properties. • Explain how metal oxides react with acids and bases. • Predict products of reactions involving metal oxides.
Basic Practical Skills	Practical Focussing on Measuring Time	36	• Following a written method • Recording and Analysing Results • Plotting Graphs • Drawing Conclusions
P4: Nuclear Energy	Advantages and Disadvantages of the Nuclear Industry	37	• Describe how nuclear energy is generated. • Explain the advantages and disadvantages of nuclear power. • Evaluate the role of nuclear energy in future energy production.
C4: Extraction of Metals	Extraction using Carbon and the Reactivity Series	38	• Describe how metals are extracted from their ores. • Explain how the reactivity series determines extraction methods. • Evaluate the environmental and economic impacts of metal extraction.
Basic Practical Skills	Practical Focussing on Measuring Mass	39	• Following a written method • Recording and Analysing Results • Plotting Graphs • Drawing Conclusions