Headlands School Science - KS4 Assessment Strands - *Key Knowledge and Application students need to be able to do to succeed*

Unit	Emerging	Developing	Secure	Excelling
B1 Cells and respiration	Draw label and describe the function of organelles of cells	Explain how a microscope works to enable us to view a cell	Explain how reactants move around the body and arrive in a cell for respiration and the equations	Suggest how and why the body responds to respiration
C1 Atomic structure	Use the periodic table to identify elements in a compound and state the no. of atoms	Draw a labelled diagram of a specific atom using the periodic table	Explain the patterns in the periodic table and link to reactivity	Evaluate different models of the atom over time
P1 Energy	State everyday uses and sources of energy	Identify 8 energy stores and 4 energy transfers	Use diagrams to describe simple energy transfers	Manipulate and use energy equations
B2 Biomolecules	Describe functions of tissues and organs within the double circulatory system, pulmonary system and digestive system	Describe how the structure of a leaf is adapted to allow processes such as photosynthesis, translocation and transpiration	Explain how enzymes allow mammals to survive and their role in food tests	Evaluate how enzymes optimal conditions allow organisms to survive in adverse conditions
C2 Bonding	Identify the type of bonding given the formula of a compound	Describe in terms of electrons how each type of bonding occurs	Draw accurate diagrams depicting different types of bonding	Link properties of a substance to its electrons, bonding and structure

P2 Electricity	Identify standard circuit symbols, recognise series & parallel circuits and define the terms current, voltage & resistance quantitatively	Describe the use of standard circuit components and state their effects in series & parallel circuits	Calculate current and voltage and resistance using equations (3) recalled	Interpret IV characteristic graphs in terms of resistance and **rearrange** learnt equations
B3 Infection and response	Identify the cause, mechanism of spread, symptoms and treatment of different communicable diseases	Describe how we are protected from pathogens, including the two ways our white blood cells work	Explain how vaccinations and associated drug trials induce long-term immunity	Suggest the reason of the high cost of drugs and explain the sources of different drugs
C3 Quantitative chemistry	Interpret the pH of a substance using universal indicator	Describe how to make a soluble salt from an acid and base	Calculate the molecular mass from salts made in neutralisation reactions	Apply molecular masses to proving the law of conservation of mass for neutralisation reactions
P3 Particles	Describe the structure of an atom and the arrangements of particles in solids, liquids and gases	Describe experiments to find density and specific heat capacity and explain the expected results	Evaluate the properties and uses of different radioactive sources	Use the kinetic theory to explain results of the SHC experiments and find half life from experimental data

B4 Homeostasis	Identify the methods of communication within the body and what conditions need to be maintained	Describe the 7 parts of a reflex arc and compare to conscious actions	Explain how both diabetes can be caused with the role of insulin also explained	Analyse the roles of hormones: thyroxin, adrenaline, glucagon in the context of homeostasis.
C4 Rates and equilibrium	Recognise that some reactions are endothermic and reversible. Identify factors which can affect the rate of reactions	Interpret reaction profiles and the directions of reversible reactions. Describe using collision theory, how changing factors affects the rate of reaction	Calculate overall energy changes and rates of reactions using data + simple graphs and explain dynamic equilibrium	Evaluate rates of reactions from tangents of graphs. Apply le chatelier's principle to shifting equilibrium
P4 Forces	Label common forces responsible for examples, name the effects of forces	Give example of effects of resultant forces including deformation and acceleration	Calculate resultant forces and their effects using the force equation	Explain how an electric motor works

B5 Inheritance	State the theory of evolution through natural selection and give examples	Describe the aims and outcomes behind the human Genome project	Explain the advantages and disadvantages of sexual and asexual reproduction	Predict different phenotypes based on the construction of punnett squares from selective breeding
C5 Hydrocarbons and electrolysis	State the tests for hydrogen, oxygen, carbon dioxide, chlorine and the test between an alkane and alkene	Describe and explain what happens during the processes of fractional distillation, cracking and chromatography	Describe what is made during the electrolysis of molten and aqueous ionic substances	Explain, including half equation, what is made at each electrode during the electrolysis of molten and aqueous ionic substances.
P5 Motion	Explain Newton's first law and give examples including motion, springs and magnets	Describe experiments to investigate Newton’s second law and the shape of magnetic fields, and state expected outcomes	Describe the use of experimental data to find quantities including speed, acceleration, spring constant and force on a current carrying wire	Derive SUVAT equations and define the principle of the conservation of momentum

B6 Ecology	Identify the factors that can contribute to changes in distribution of organisms	Explain the effects of human population on the population of other organisms across the biosphere	Describe the processes of decomposition, combustion, photosynthesis and respiration in terms of Carbon cycling. Interpret graphical data on these cycles	Calculate distributions of organisms in real examples justifying the choice of equipment and technique used.
C6 Earth's atmosphere and resources	State the causes of environmental problems such as global warming, climate change, acid rain and water pollution	Describe how gases in the air have changed over time and how human uses of earth's resources are affecting their amounts	Explain how humans uses of earth's resources are affecting the planets air, climate, water and land and describe how the animals and plants are affected	Evaluate the links between humans uses of earth's resources and environmental problems such as climate change and suggest possible solutions
P6 Waves	State 7 types of electromagnetic radiation in order and give examples of uses and dangers for each	Label a diagram showing main characteristics of two types of wave and give examples of each	Describe using diagrams how waves behave at boundaries between mediums	Manipulate the wave equation and using standard form where appropriate