

Science Curriculum						
Year	Half-term 1	Half-term 2	Half-term 3	Half-term 4	Half-term 5	Half-term 6
7	Knowledge that will be taught: The Scientific Method Substantive knowledge - The definitions of independent, dependent and control variables - The hazards associated with chemicals and lab work Disciplinary knowledge - Observation, hypothesis and theory - Working with variables - Methods - How to do practical work like a scientist - Collecting data to test a hypothesis - Data analysis and communication	Knowledge that will be taught: Movement and Organisation Substantive knowledge - Animal and plant cells - Specialised cells - Using microscopes to see cells - Unicellular organisms - Skeletal system - Muscles and joints Disciplinary Knowledge - Preparing microscope slides - Using a microscope - Scientific drawings - Magnification calculations	Knowledge that will be taught: Matter and Mixtures Substantive knowledge - states of matter - interparticle forces - solids - fluids (liquids and gases) - viscosity - diffusion - Changes of state - The particle model - Solutions - Separation techniques Disciplinarity knowledge - Interpreting boiling point data - Writing scientific explanations - Collecting data and calculating mean values - Planning investigations - Writing a scientific method - Writing a conclusion - Scientific drawings - Planning and working as a team - Measuring accurately - Using equations -	Knowledge that will be taught: Forces and Motion Substantive knowledge - speed - distance-time - Acceleration and relative speed - forces - free body diagrams - friction - forces and motion - gravity - mass and weight - gravity and drag - Hooke’s Law - Pressure in solids and fluids - buoyancy Disciplinary knowledge - Using equations - Collecting data - Plotting graphs	Knowledge that will be taught: Genes and Reproduction Substantive knowledge -reproduction -puberty -menstrual cycle -embryo development -early life development -factors affecting development -fertility -plant reproduction -seed dispersal -variation -genetic material -modelling inheritance -natural selection -evolution by natural selection -biodiversity -extinction Disciplinary knowledge - How scientists use observations to test hypothesis - Using evidence to draw conclusions	Knowledge that will be taught: Elements and the Periodic Table Substantive knowledge -elements -simple atomic structure -the periodic table -metals and non-metals -properties of materials -compounds -chemical vs physical changes -reacting elements with oxygen -conservation of mass -representing reactions Disciplinary knowledge - Balancing equations - Recording observations - Understanding common prefixes
8	Knowledge that will be taught: Respiration and Photosynthesis Substantive knowledge - Aerobic respiration - Gas exchange - Glucose - Digestion - Enzymes and absorption - Photosynthesis - Leaf microscopy Disciplinary knowledge - Interpreting graphical data - Collecting data - Plotting graphs - Writing a scientific conclusion - Continuous and categoric data - Biological drawing	Knowledge that will be taught: Energy Substantive knowledge - What energy is - Energy stores - Energy transfers - Gravitational potential and kinetic stores - Elastic potential stores - Power - Conservation of energy - Energy in the home - Energy efficiency - Conduction - Convection - Radiation and evaporation - Heating and cooling - Change in state Disciplinary knowledge - Working with formulae - Converting units - Calculating percentages .	Knowledge that will be taught: Reactions Substantive knowledge - Reactions of metals - Oxidation - Displacement reactions - Acids and reactions of acids - Neutralisation - Decomposition - Precipitation - Energy changes Disciplinary knowledge - Hazard awareness and working safely - Defining variables in an investigation - Writing an investigative question - Collecting data and calculating mean values - Writing a scientific method - Following a method	Knowledge that will be taught: Electricity Substantive knowledge - Charge - Current and voltage - Drawing and making circuits - Measuring current and voltage - Ohm’s law and resistance - Magnetism - Electromagnets Disciplinary knowledge - Circuit construction - Collecting and recording data - Interpreting voltage-current graphs - Following a written method - Writing scientific explanations	Knowledge that will be taught: Waves Substantive knowledge - What waves are - Longitudinal and transverse waves - Properties of waves - Sound - Light - Colour and the electromagnetic spectrum - Reflection - Refraction - Lenses - Vision Disciplinary knowledge - Measuring angles - Collecting data - Working accurately - Working with formulae - Drawing scientific diagrams - Interpreting graphical data	Knowledge that will be taught: Earth and the Universe Substantive knowledge - The Earth’s structure - Igneous rocks - Weathering, erosion, transportation and deposition - The rock cycle - Extraction of metals - Climate change - Our solar system - Days, seasons and years - The moon - Our place in the universe - Space exploration Disciplinary knowledge - Understanding very large distances - The value of scientific evidence
9	Knowledge that will be taught: - Biology -Cell Biology - Chemistry - Atomic Structure	Knowledge that will be taught: - Biology - Cell Biology - Physics - Energy	Knowledge that will be taught: - Biology -Organisation - Physics - Energy	Knowledge that will be taught: - Biology -Organisation - Physics – states of matter	Knowledge that will be taught: - Chemistry – Bonding - Physics – States of matter	Knowledge that will be taught: - Physics – Atomic structure - Chemistry – Bonding
10	Knowledge that will be taught: - Biology – Infection and Response - Chemistry – Chemical changes - Physics – Atomic structure	Knowledge that will be taught: - Biology – Infection and Response - Chemistry – Energy changes - Physics – Electricity	Knowledge that will be taught: - Biology – Bioenergetics - Chemistry – Rates - Physics – Electricity	Knowledge that will be taught: - Biology – Bioenergetics - Chemistry – Rates - Physics - Forces	Knowledge that will be taught: - Biology – Homeostasis - Chemistry – Quantitative - Physics - Forces	Knowledge that will be taught: - Biology – Homeostasis - Chemistry – Organic - Physics - Forces
11	Substantive knowledge - Biology -Homeostasis and response - Chemistry – Rates of reaction - Physics – Forces Disciplinary knowledge - Required practicals – reaction times, chromatography, hookes law, acceleration	Substantive knowledge - Biology - Homeostasis and response/ Inheritance, variation and evolution - Chemistry – Organic/Chemical analysis - Physics – Waves Disciplinary knowledge - Required practicals – plant responses, light, identifying ions, water purification, waves	Substantive knowledge - Biology - Inheritance, variation and evolution - Chemistry – Atmosphere/Using resources - Physics – Magnetism Disciplinary knowledge - Required practicals - electromagnets	Substantive knowledge - Biology – Ecology - Physics – space - Revision for chemistry and physics Disciplinary knowledge - Required practicals – field investigations, decay	Knowledge that will be taught: - Revision - Exams	

12 Biology	Knowledge that will be taught: - Biological molecules - Carbohydrates, lipids, proteins, enzymes - Cell structure	Knowledge that will be taught: Biological molecules - continued Mitosis/meiosis Transport across a membrane Structure of membranes, diffusion, osmosis	Knowledge that will be taught: Nucleic acids RNA, DNA, Water ATP Digestion and absorption Transport across a membrane - continued	Knowledge that will be taught: - DNA/genes - replication - Protein synthesis - Genetic diversity and adaptation - Mutations, meiosis, selection - Cell recognition and immunity Phagocytosis, Lymphocytes, antibodies, vaccines	Knowledge that will be taught: - Species and taxonomy - Biodiversity within a community - Species, taxonomy, diversity, quantitative analysis - Gas exchange - Fish, insects, plants, breathing, lings, digestion	Knowledge that will be taught: - Photosynthesis - Mass transport - Heart, circulation, blood, vessels - Respiration - Energy and ecosystems - Populations, cycles
13 Biology	Knowledge that will be taught: - Photosynthesis and Respiration - Stimuli and Response - Inheritance Scientific essay writing – learning how scientific essays differ from the essays they will be used to writing	Knowledge that will be taught: - Nervous Coordination - Evolution and speciation - Allopatric, sympatric - Populations in ecosystems Reading scientific articles/journals	Knowledge that will be taught: - Skeletal Muscles - Structure, function, sarcolemma - Homeostasis - Menstrual cycle, blood glucose, thermoregulation - Gene technology Genetic engineering, genetic modification, ethics	Knowledge that will be taught: - Homeostasis continued - Genome projects	Knowledge that will be taught: - Revision - Exams	
12 Chemistry	Knowledge that will be taught: - Fundamental particles - Relative masses - Electron configuration* - Moles - Types of bonding - Shapes of molecules*	Knowledge that will be taught: - Balancing equations - Reacting mass calculations - Concentration calculations - Nomenclature Fractional distillation, cracking and alkanes	Knowledge that will be taught: - Required practical 1 - Group 2 elements - Ideal gas equation Isomerism	Knowledge that will be taught: - Enthalpy Change - Calorimetry - Alkenes and polymers Required practical 5	Knowledge that will be taught: - Hess's law - Bond enthalpies - Redox reactions - Halogens - Required practical 2 - Required practical 4	Knowledge that will be taught: - Kinetics - Required practical 3 - Equilibrium - Halogenoalkanes - Alcohols - Organic analysis - Required practical 6
13 Chemistry	Knowledge that will be taught: - Optical isomerism - Aldehydes and ketones - Aromatic chemistry - Amines - Chromatography - Polymers - Amino acids and proteins	Knowledge that will be taught: - Carboxylic acids and derivatives - Organic synthesis - Required practical 10 - Enzymes and DNA - Thermodynamics - Electrode potentials and cells - Required practical 8	Knowledge that will be taught: - Rate equations - Required practical 7 - Commercial applications of electrochemical cells - Period 3 elements and oxides - Transition elements	Knowledge that will be taught: - Equilibrium constant - Acids and bases - Required practical 9 - Transition elements continued - Reactions of ions in aqueous solution Required practical 11	Knowledge that will be taught: - Revision - Exams	
12 Physics	Knowledge that will be taught: - Matter and Radiation - Forces in equilibrium	Knowledge that will be taught: - Quarks and Leptons - On the move	Knowledge that will be taught: - Quantum Phenomena - Newtons Laws of Motion	Knowledge that will be taught: - Waves - Force and Momentum	Knowledge that will be taught: - Optics - Work, Energy and Power	Knowledge that will be taught: - Materials - Electric power - Review of Y12 and begin Y13 Content
13 Physics	Knowledge that will be taught: - Further Mechanics and Thermal Physics - Simple Harmonic Motion	Knowledge that will be taught: - Thermal Physics - Gases	Knowledge that will be taught: - Fields - Electric fields - Magnetic fields - Capacitors - Gravitational Fields - Electromagnetic Induction	Knowledge that will be taught: - Nuclear Physics - Option Block - Astrophysics	Knowledge that will be taught: - Revision - Exams	