

YEAR 7		AUTUMN TERM				YEAR 7		SPRING TERM				YEAR 7		SUMMER TERM			
POWERFUL IDEAS	Energy, Atoms, Cells and organisation	CEIAG	Rollercoaster engineer: CERN: be a particle scientist Physiotherapist	Focused retrieval 6 topics	KS2 Light: KS2 Particle model: TBC	POWERFUL IDEAS	Atoms, Cells and organisation Forces	CEIAG	Chocolatier Midwife F1 forces on a racing car	Focused retrieval 6 topics	Y7 Atoms: KS2 Reproduction KS2 Forces	POWERFUL IDEA	Atoms, Energy	CEIAG	Pollution control officer Insulating homes and climate change	Focused retrieval 6 topic	KS2 chemical changes Y7 Energy stores
TOPICS	Substantial knowledge (KNOW)	Disciplinary Knowledge (KNOW HOW TO)		Literacy	TOPICS	Substantial knowledge (KNOW)	Disciplinary Knowledge (KNOW HOW TO)		Literacy	TOPICS	Substantial knowledge (KNOW)		Disciplinary Knowledge (KNOW HOW TO)		Literacy		
ENERGY STORES AND TRANSFERS	Lab safety, Conservation of energy law, stores of energy, energy transfers, efficiency, energy in falling objects	Identify energy stores and energy transfers, construct energy transfer diagrams, sankey diagrams, translate data between forms, calculate efficiency,		kinetic, potential, magnetic, energy, conservation, fuel, renewable, thermal	ELEMENTS AND COMPOUNDS	elements, elements in the periodic table, metals and non-metals, what is a chemical reaction, oxidation of metals, writing equations	representing elements and compounds using the particle model; representing reactions using equations;		compound; chemical bond; symbol; formula; property; reactants; products, molecule, aqueous, state symbol	ACIDS AND BASES	What is an acid/alkali/neutralisation. What the pH scale is used for. Where indicators come from. Why universal indicator is so useful. Reactions of acids with metals and carbonates.		use pH scale; determine what makes a good indicator. name some common salts, work safely, measure liquids, make observations		acid, alkali, pH scale; strong, weak; indicator; base; neutralisation, salt		
PARTICLES	Particle model. Pure and impure. Expansion and contraction. gas pressure, Change of state. Diffusion. The atom. Elements, mixtures, Solutions. crystallisation, Separating techniques	Draw particle diagrams. Models. Carry out chromatography. Plot graphs. Interpret a cooling curve. Classify substances.		model, melting point, boiling point, limitation, expansion contraction, diffusion, atom, element, mixture, soluble insoluble, dissolve, solvent, solute, solution, saturated, solubility, crystallisation, filtration, evaporation, chromatography	REPRODUCTION	Human reproductive system, adolescence, menstrual cycle, fertilisation, gestation, lifestyle and pregnancy, plant reproduction, seed dispersal.	evaluate lifestyle impacts on pregnancy, investigate factors affecting seed dispersal		Uterus, Ovaries, Testes, Menstrual, Fertilisation, Adolescence, Hormone, Foetus, Placenta, Pollination, Dispersal	HEAT	Energy in food and fuels; Conduction, convection, radiation		Using a bunsen burner (already seen in evaporation practical in chemistry??) Identify hazards and risks Draw a table given the headings. Plot data on a bar chart given axis. Label axis with units and name from given variable Rank food from larges to small energy content based on results Choose DV, IV and CV from options		conduction, convection, radiation, fuel		
CELLS AND ORGANISMS	Plant and animal cell structure, specialised cells unicellular organisms, organisation diffusion, organisation, skeleton, joints and muscles.	Use of a microscope, making onion slides, modelling diffusion, evaluating ideas (what makes something alive), modelling joints,		Nucleus, Cytoplasm, Mitochondria, Membrane, Chloroplast, Vacuole, Microscope, Unicellular, Specialised, Diffusion, Palisade, Cartilage, Ligament, Antagonistic	FORCES	Forces, force diagrams, balanced and unbalanced forces, rockets (streamline and air resistance)	Identify forces in simple systems such as a car moving (thrust and air resistance), falling objects (force due to gravity and air resistance), object on a table (force due to gravity and normal force). Measure forces with a Newton meter.		magnitude, equilibrium, streamline, air resistance								

YEAR 8		AUTUMN TERM				YEAR 8		SPRING TERM				YEAR 8		SUMMER TERM			
POWERFUL IDEAS	Ecosystems Chemical reactions; Forces	CEIAG	The environment agency Principle scientist	Focused retrieval 6 topics	Y7 Cells Y7 Elements and compounds TBC	POWERFUL IDEAS	Organisation Chemical reactions Forces	CEIAG	Health and respiratory physiologist Mining	Focused retrieval 6 topics	Y7 Organisation 1 Y7 particles TBC	POWERFUL IDEA	Genetics Waves Earth and atmosphere	CEIAG	TBC Lighting technician TBC	Focused retrieval 6 topic	TBC KS2 Light KS2 Rocks
TOPICS	Substantial knowledge (KNOW)	Disciplinary Knowledge (KNOW HOW TO)		Literacy	TOPICS	Substantial knowledge (KNOW)	Disciplinary Knowledge (KNOW HOW TO)		Literacy	TOPICS	Substantial knowledge (KNOW)		Disciplinary Knowledge (KNOW HOW TO)		Literacy		
ECOLOGY	Photosynthesis, plant structure, ecosystems, food chains and webs including bioaccumulation, adaptations, carbon cycle, human impacts on the environment	Use of iodine to test for starch, investigating adaptations, evaluating human impact on ecosystems		Photosynthesis, Producer, Ecosystem, Palisade, Epidermis, Consumer, Bioaccumulation, Adaptation, Respiration, Photosynthesis, Carbon	ORGANISATION 2	Lung structure, breathing, respiration, lung disease, diet and food groups, digestive system, enzymes food tests.	Compare breathing and respiration, analyse data relating to disease, investigate factors affecting enzyme action, Interpret food test reagent results.		Oesophagus, Pancreas, Intestine, Enzyme, Catalyst, Digestion, Carbohydrates, Protein, Minerals, Benedicts, Iodine, Respiration, Aerobic, Anaerobic, Mitochondria, Exothermic.	VARIATION and GENETICS	Types of variation, DNA and its discovery, Inheritance, natural selection evolution, extinction, fossils.		Investigate types of variation, interpret graphs showing variation, Predict simple inheritance, model evolution, suggest reasons for extinctions, model fossil formation.		variation, inheritance, DNA, fossils, evolution, extinction		
CHEMICAL REACTIONS	conservation of mass, balancing equations, Conservation of Mass application. The products when metal carbonates undergo thermal decomposition reactions. The effect catalysts have on reactions, Fermentation	How to write word equations. How to use conservation of mass to calculate quantities. To work safely, selecting the correct equipment for the practical. Take measurements using a balance. Use a Bunsen. To calculate the mass of oxygen gained during oxidation. Write word and balanced symbol equations. Recognise a thermal decomposition reaction from an equation. present observations and data using appropriate methods, including tables and graphs		conservation, analysis, thermal decomposition, catalyst, exothermic, endothermic	REACTIVITY	Products when a metal and acid react. Reactivity change in groups 1 and 7. Reactivity series. Displacement reactions.	Compare properties through experiment Classify unknown substances. Make predictions about reactions of elements based on their position within a group. Make and record accurate experimental observations		atom, proton, neutron, electron, nucleus, electron shell, group, period, alkali metal, halogen, halide, reactivity, displacement, electrolysis, ore	WAVES	Types of waves, making and detecting sound, representing sound, light, splitting light, reflection, refraction, the eye, pinhole cameras.		Recognise transverse waves, recognise longitudinal waves and Label them. To know how to draw a sound wave diagram and represent sounds of different amplitudes Know how to draw light ray diagrams paying attention to the lines being straight, arrows showing direction Draw a diagram using a light box and mirror. How to use a protractor to measure an angle Draw a diagram using a light box and a perpex/glass block How to use a protractor to measure an angle		matter, modle, longitudinal, transverse, reflection, refraction, echo.		
FORCES	Mass, weight, gravity, solar system, friction, work done, Hooke's law, moments, all related units.	Calculate weight, work done, force of a spring and moments. Draw tables, collect data, use a Newton meter, calculate mean values, draw and plot a graph. Proportional and directly proportional graphs. Write a hypothesis.		Gravity, weight, mass, gravitational field strength, Newtons, proportional, directly proportional, moment, pivot, work done,	MOTION AND SPACE	Speed, distance-time graphs, forces and motion, relative motion, motion in space and universe, day and night, seasons, how the universe formed.	To calculate speed using speed = distance / time. Draw distance time graphs for Constant Speed, stationary, accelerating and decelerating. To be able to describe a journey from a distance time graph. To interpret a paragraph of text and able to answer questions based on said paragraph. To be able to interpret a distance-time graph and describe the journey. To be able to clearly describe the motion, and show detail about distance, time and average speed from the graph. To draw a free body diagram with perpendicular or opposite forces		stationary, accelerating, decelerating, displacement, universe,	EARTH'S STRUCTURE	Age and structure of Earth. Formation and properties of rock types. Rock cycle. Classification of rocks.		Explain models of the Earth. Compare different ways of presenting information. Use classification charts.		core, mantle, crust, sedimentary, igneous, metamorphic, extrusive, intrusive, crystalline.		

YEAR 9		AUTUMN TERM				YEAR 9		SPRING TERM				YEAR 9		SUMMER TERM			
POWERFUL IDEAS	Earth and atmosphere Analysis Energy Cells	CEIAG	Volanologist, scene of crime officer, Working in the renewable energy industry Microbiologist	Focused retrieval 6 topics	TBC TBC Y7 Heating Y7 Cells	POWERFUL IDEAS	Earth and atmosphere Electricity Organisation Earth and atmosphere	CEIAG	Vehicle maintenance Working at a nuclear power station TBC Water quality scientist	Focused retrieval 6 topics	Y8 Carbon cycle Y8 Waves Y8 Organisation Y7 Separating techniques	POWERFUL IDEA	Organisation Forces	CEIAG	TBC Mechanical engineer	Focused retrieval 6 topic	Y7/8 Organisation Y7/8 Forces
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EARTH'S STRUCTURE	Age and structure of Earth. Formation and properties of rock types. Rock cycle. Classification of rocks.	Explain models of the Earth. Compare different ways of presenting information. Use classification charts.		core, mantle, crust, sedimentary, igneous, metamorphic, extrusive, intrusive, crystalline.	Atmosphere	the atmosphere, the early atmosphere, the greenhouse effect, production of greenhouse gases, global warming, fossil fuels, carbon footprint, other pollutants.	Draw conclusions from graphs. Calculations, calculating mean, appropriate decimal places. Write word and balanced symbol equations.		atmosphere, pollutant carbon footprint, global warming, Greenhouse effect, combustion, climate	ANIMAL ORGANISATION	Food tests, digestive system, enzymes, factors affecting enzymes, heart, circulation, blood and blood vessels, coronary heart disease	use qualitative reagents to test for a range of carbohydrates, lipids and proteins; represent the action of enzymes using simple word equations e.g. starch → glucose for amylase use of the lock and key model to explain enzyme action. Interpret graphs in relation to factors affecting enzyme action, calculate rate for chemical reactions, use a continuous sampling technique, use iodine reagent to test for starch; identify variables, *Calculate rate of blood flow. Identify blood components from a photograph or diagram.		Biuret, Benedicts, proteins, carbohydrates, lipids, bile, gall bladder, emulsify, enzyme, lock and key, catalyst, carbohydrases, amylase, protease, lipases, amino acids, fatty acids, sugars, rate, atria, ventricles, aorta, vena cava, pace maker, trachea, bronchi, alveoli, gas exchange, platelets, haemoglobin, deoxygenated, pulmonary, stents, statins, arteries, veins, capillaries.			
					Electricity 1	Charge, potential difference, current in series and parallel circuits, ohms law, resistance, AC/DC, National grid, safety around electricity, domestic electricity	Use circuit diagrams to construct and check series and parallel circuits that include a variety of common circuit components. Draw circuit diagrams. Use appropriate apparatus to investigate resistance in a wire, safely. Calculate resistance. Plot a graph. Wire a plug.	Current, potential, charge, resistance, transformer, electron, variable, alternating,									
ANALYSIS	Pure substances and formulations; chromatography, testing for different gases.	Use melting point and boiling point data to distinguish pure from impure substances. Identify formulations. Distinguishing pure substances from impure substances using chromatography. Interpret chromatograms and determine Rf values. Describe and carry out the tests for common gases		chromatography retention factor, limewater, formulation	Plant Organisation	Principles of organisation, plant organisation, transpiration, translocation	Understand the size and scale in relation to cells, tissues, organs and systems. Use simple compound measures such as the rate of transpiration. Translate information between graphical and numerical forms. Plot and draw appropriate graphs, selecting appropriate scales for axes. Extract and interpret information from graphs, charts and tables.		transpiration, translocation, tissue, organ, epidermis, palisade, spongy mesophyll, xylem, phloem, guard cells, stomata, meristem.	FORCES PART 1	Gravitational forces, electrostatic forces, electrostatic fields, magnetic fields, electromagnetism, pressure, atmospheric pressure, pressure in fluids	Draw gravitational field lines ; Draw Electrostatic field lines for point charges of both positive and negative; Draw electrostatic field lines between 2 charged plates; Draw the magnetic field lines around a bar magnet; Build circuits and investigate the variables effecting the strength of an electromagnet; calculate pressure;		Force, accelerate, pressure, magnetism, electromagnetism, electrostatic, solenoid, atmospheric			
Energy PART 1	Energy stores, energy transfers, conservation of energy, efficiency, thermal insulation, generating electricity, renewable and non-renewable resources	Identify energy stores. Identify energy transfers. Calculate useful and wasted energy transfers. Interpret Sankey diagrams. Calculate efficiency. Investigate different forms of insulation. Identify variables. Draw cooling curves. Compare power ratings, energy transfers and domestic fuel bills. Draw a flow diagram showing the energy transfers taking place in power stations.		Kinetic, thermal, gravitational, nuclear, advantage, disadvantage, solar, geothermal, conservation, efficiency, conduction, insulation	Earth's Resources	Finite and renewable resources, using resources, potable water, waste water, life cycle assessments, reduce reuse recycle.	Extract and interpret information about resources from charts, graphs and tables. use orders of magnitude to evaluate the significance of data. Follow instructions and carry out a practical safely. Use a measuring cylinder. Use a balance. Use a Bunsen burner. Carry out simple comparative LCAs. Evaluate the use of resources.		finite, sustainability, synthetic, potable, desalination, sterilising, distillation, evaporate, sedimentation, effluent, anaerobic, aerobic								
Cells	Eukaryotic, prokaryotic, specialised cells, diffusion, osmosis, active transport, adaptations for exchange,	recognise, draw and interpret images of cells,		prokaryote, eukaryote,													
Microscopy	Orders of magnitude, microscopy,	Use estimations and explain when they should be used to judge relative size or area of sub-cellular structures, use images of cells in photographs or micrographs and comparing these to their own drawings; use a light microscope to observe, draw and label a selection of plant and animal cells; use appropriate apparatus to record length and area (ruler); use a microscope to make observations of biological specimens and produce labelled scientific drawings.		magnification, resolution, magnitude													

NOTE: due to some curriculum changes topics may appear more than once as the new sequence runs through: for example: Earth's Structure