

Year:10

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Content Knowledge	<p>C5 - Chemical Changes Content: Reactivity Series Displacement reactions Extracting Metals Salts from metals and bases Neutralisation and pH scale Strong and Weak Acids</p> <p>Knowledge: Know how some common metals react with water How to write ionic displacement reactions Identify which substances have been oxidised or reduced Predicting products from their reactants Deducing the formulae of common salts Recall the different reactions of acids Why chemicals are either acids or alkali How to identify acids and alkalis How pH and acid concentration link</p> <p>Required Practicals Making Copper Salts Making a salt from a metal carbonate</p>	<p>C6 - Electrolysis What is electrolysis Extraction of aluminium Electrolysis of Solutions</p> <p>C6 Knowledge: Know how electrolysis works Understand why electrolysis only works with ionic compounds What happens to ions during electrolysis How does water affect the products of electrolysis How to extract aluminium Products from the electrolysis of brine</p> <p>Required Practical Investigating the electrolysis of different solutions</p> <p>P7 Radioactivity: Atoms and Radiation Discovery of the Nucleus Alpha, Beta and Gamma Radiation Activity and Half-life</p> <p>P8 Forces in Balance: Vectors and Scalars Resultant Forces Centre of Mass Resolution of Forces</p> <p>P9 Motion: Speed and Distance-Time Graphs</p>	<p>C7 - Energy Changes Exo and Endothermic reactions Reaction Profiles Bond Energy Calculations</p> <p>C7 Knowledge: How to distinguish between exo and endothermic reactions Where exo and endothermic reactions are used in everyday life How to draw simple reaction profiles Calculating the over energy change of a reaction</p> <p>Required Practical Investigating temperature changes of different reactions</p> <p>Chapter B10 Knowledge: Identify why it is important for the body to maintain an internal balance. Describe how the body maintains homeostasis. Recall parts of the central nervous system. Explain how a reflex occurs and the role of synapses. Required Practical: Measuring reaction times</p> <p>P10 Force and Motion:</p>	<p>C8 - Rates and Equilibrium Rates of Reactions Collision Theory Factors affecting collision theory Reversible Reactions Dynamic Equilibrium</p> <p>C8 Knowledge: Different ways of measuring rates of reactions Know the factors that affect the rate of reaction Explain how different factors affecting collision theory affect the rate of reaction Know what a reversible reaction is and how to represent them What happens in the energy transfers in reversible reactions</p> <p>Required Practical Investigating how concentration and mass can affect the rate of reaction.</p> <p>Required practical recap - complete all the required practicals and go over skills required</p>	<p>C9 - Crude Oil and Fuels Content: Hydrocarbons Fractional Distillation Burning fuels Cracking</p> <p>C9 Knowledge: Know the composition of crude oil Naming and representing alkanes Process of fractional distillation Identify the different types of combustion Know why we need to crack long chain hydrocarbons</p> <p>B11 Hormonal Communication Mammals: Hormonal control Controlling blood glucose levels Diabetes and its treatment Negative feedback Human reproduction The menstrual cycle Artificial control of fertility Infertility treatments</p> <p>Chapter B11 Knowledge: Recognise how hormones are involved with maintaining homeostasis in mammals. Explain how blood glucose levels are controlled. Describe the</p>	<p>C10 - Chemical Analysis C10 Knowledge: How chromatography can identify between pure and impure substances How chromatography works Tests for common gases</p> <p>B15 - Adaptations, interdependence, and competition: Competition in animals and plants Adaptations in animals and plants</p> <p>Chapter B15 Knowledge: Know what animals and plants compete for. List different adaptations plants and animals have and describe how these adaptations aid in their survival.</p> <p>P11 Force and Pressure: Pressure and surfaces Pressure in a liquid at rest Atmospheric pressure Upthrust and flotation</p> <p>P12 Electromagnetic Waves: The electromagnetic spectrum Infra-red, Microwaves, Radio Waves Ultraviolet, X-rays, gamma</p>

	<p>B8 - Bioenergetics: Photosynthesis Plant cells and chloroplast Rate of photosynthesis Glucose Optimising photosynthesis</p> <p>Chapter B8 Knowledge: Recognise the need for photosynthesis in plants and the role that plant cells and their chloroplasts play. Describe the process of photosynthesis identifying the reactants and products. Describe factors that affect the rate of photosynthesis. Describe how plants use the glucose produced in photosynthesis.</p> <p>Required Practical: Light intensity and the rate of photosynthesis</p> <p>B9 - Bioenergetics: Respiration Aerobic vs. Anaerobic respiration Exercise and the body Oxygen debt Fermentation</p> <p>Chapter B9 Knowledge: Explain the difference between aerobic and anaerobic respiration. Explain what is meant by an oxygen debt. Know that anaerobic respiration takes place in different organisms and how it differs in each.</p>	<p>Velocity and acceleration Analysing Motion Graphs</p>	<p>Force and acceleration Weight and terminal velocity Forces and breaking</p> <p>Required Practicals: Investigating the relationship between force and acceleration Investigating the relationship between force and the extension of a spring</p>		<p>different types of diabetes and how they are treated. Explain what is meant by negative feedback and its role in the body. Identify hormones involved in human reproduction, their roles and where they are produced. Outline the menstrual cycle and explain how it is controlled by hormones. List different methods of contraception and compare their effectiveness. Evaluate different solutions and treatments for infertility.</p>	<p>rays X-rays in medicine</p>
Skills	Writing word and	Representing the	Plan an investigation on	Calculating the rate of a	Drawing and representing	To recall and identify

	<p>chemical equation for photosynthesis Quantitatively test the rate of photosynthesis Qualitatively test exercise affects pulse</p> <p>Deduce reactivity of metals from experimental data Predict reactions of unfamiliar metals when given information of their reactivity Identifying which chemicals have been oxidised or reduced in an ionic equation Evaluate processes used to extract different metals Predict products from their reactants Preparing a salt safely from its reactants</p>	<p>reactions occurring at each electrode as a half equation Predicting the products of the electrolysis of aqueous solutions Recording information from a practical Identifying the risks and hazards of a practical</p>	<p>identifying temperature change for different solutions. Evaluate the uses and applications of exo and endothermic reactions when given appropriate information Identify reaction profiles for exo and endothermic reactions Calculate the overall energy change for a reaction To recall and identify correct scientific knowledge To be able to draw and analyse graphs correctly</p> <p>To be able to use and manipulate $f = ma$ equation</p>	<p>reaction at a specific time. Planning a practical Interpreting graphs Linking the changes in condition with the composition of a reaction Evaluating the uses of catalysts</p> <p>All practical skills</p>	<p>chemicals Writing balanced equations for complete and incomplete combustion</p>	<p>correct scientific knowledge</p> <p>Interpret data from tables and graph</p> <p>Evaluate modern instrumental methods with traditional analysis methods.</p> <p>Evaluate the quality of evidence in a report about global climate change</p> <p>To be able to compare and contrast differences in uses for various sections of the the EM spectrum</p>
Key Questions	<p>How do plants use the glucose they make during photosynthesis? How does exercise affect breathing and heart rate?</p> <p>How can we extract metals from their ores?</p>	<p>How can we decompose ionic compounds to get useful products? Why do chemical reactions always involve energy transfers?</p> <p>How can you work out the acceleration of an object from a speed-time graph?</p>	<p>How does the nervous system help with survival? What factors affect reaction times? What is homeostasis and why is it so important?</p>	<p>How are reaction rates affected by changing conditions?</p>	<p>How is a range of useful products obtained from crude oil?</p> <p>How do hormones control the release of a mature egg in the human menstrual cycle?</p>	<p>How can we use chemical tests to identify unknown substances? What are the advantages and disadvantages of using industrial methods of analysis? What is global warming and why does it matter? How do mobile phones send signals to one another? How does your TV remote connect to your TV?What is adaptation and why is it so important?</p>
Assessment	<p>Diagnostics Test End of Chapter Test ReAct Task</p>	<p>Diagnostics Test End of Chapter Test ReAct Task</p>	<p>Diagnostics Test End of Chapter Test ReAct Task</p> <p>Joint chapter assessment</p>	<p>Diagnostics Test End of Chapter Test ReAct Task</p>	<p>Diagnostics Test End of Chapter Test ReAct Task</p> <p>Mock exams</p>	<p>Diagnostics Test End of Chapter Test ReAct Task</p>

<p>Literacy/numeracy/SMSC/Character</p>	<p>Biology Key words: metabolism, respiration, oxygen debt,</p> <p>Physics Key words: Alpha, Beta, Gamma Radiation, Atomic Number, Mass Number, Isotopes, Ionisation, Irradiation, Activity, Count Rate, Chain Reaction.</p> <p>Numeracy: Balancing equations Measuring and weight salts Relating pH value to H⁺ concentrations</p> <p>Chemistry Keywords: ores, oxidised, reduced, reactivity series, displacement, ionic, electrolysis, neutralisation, alkalis, bases, neutral, pH scale, strong acids, weak acids</p> <p>SMSC: Will mining the metal ore impact our environment? How could we extract metals sustainably? Working together to complete the practical safely.</p>	<p>Chemistry Keywords: electrolyte, anode, cathode, inert, brine</p> <p>Physics Key words: Displacement, Vector, Scalar, Magnitude, Newton's 1st and 3rd Law, Friction, Resultant Force, Moment, Gradient, acceleration, deceleration, tangent,</p> <p>Numeracy: Interpreting data and graphs, calculating percentage, drawing graphs</p> <p>Numeracy: Recording data Calculating energy changes, calculating resultant force and moments and order of magnitude Interpreting and analysing graphs correctly and calculating gradients and tangents</p> <p>SMSC: Is electrolysis the most environmentally friendly way to extract aluminium? Working together to collect data. Working together to plan an investigation. How can moments help to lift heavy objects</p>	<p>Numeracy: Interpreting data and graphs, calculating mean</p> <p>Biology Key words: homeostasis, reflex, synapse</p> <p>Chemistry Keywords: exothermic, endothermic, activation energy, bond energy.</p>	<p>Numeracy: Calculating Tangents Recording Data in a table</p> <p>Chemistry Keywords: Rate, collision theory, activation energy, gradient, tangent, catalysts, reversible reactions, hydrated, anhydrous, equilibrium</p>	<p>Numeracy: Rearranging equations Calculating the formulae of common functional groups Balancing equations</p> <p>Chemistry Keywords: mixture, hydrocarbons, fractions, alkanes, saturated, flammable, fractional distillation, oxidise, cracking, unsaturated.</p> <p>Biology Key words: hormone, pupil, lens, menstrual cycle, oestrogen, FSH, LH, contraception, infertility, IVF,</p> <p>Numeracy: Interpreting data and graphs</p> <p>SMSC: - Working together to carry out a practical. - Evaluating the uses of catalysts in Is crude oil good for our environment or should we use alternative sources?</p>	<p>Key words: adaptation, surface area: volume, photosynthesis, respiration, combustion, precipitation, decomposer, scavenger, producer, consumer, predator, prey</p> <p>Chemistry Keywords: Formulations, mixtures, chromatogram, retention factor, precipitates, atmosphere, carbon footprint, carbon storage, particulates, global dimming</p> <p>Numeracy: Measuring the height of a chromatogram Calculating the R_f Value of a chromatogram Reading pie charts Analysing graphs.</p> <p>Physics Key words: Density infrared, ultraviolet, radio waves, gamma, white light,</p> <p>SMSC: Working together to investigate chromatography Evaluating evidence that demonstrates the rise of carbon dioxide leading to climate change</p>
<p>Enrichment opportunities and futures</p>	<p>STEM Club Visiting the Science Museum Watching the Royal Institution on Youtube Visiting the Summer Fayre at the Royal Society of Chemistry Researching the uses of Crude Oil Visiting the Science Museum in Central London Investigate how radiation is used in hospitals (ie. CT scanners, PET scanners etc) Visiting Body World's exhibition in Leicester Square- Get up close to real bodies and examine their organs and systems</p>					