

S3 Chemistry Broad General Education Learning Plan

(Pupils will work through each unit and will have a research project at some point throughout the year)

Unit 1 – Chemical reactions	Unit 2 – Earth's Energy	Unit 3 – World Chemistry
<p>Learning and Teaching Focus:</p> <p>In this unit, pupils' will investigate how things are made from elements, compounds and how these are bonded together and the difference between acids and bases.</p> <p>Specific topics include</p> <ul style="list-style-type: none"> • Indicators of a chemical reaction • How we change the speed of a reaction • The periodic table of elements • Atomic structure • Elements to compounds • Relative Atomic mass • Different types of bonding • The pH scale • Metal oxides and Non-metal oxides • Environmental Impact of acids • Neutralisation 	<p>Learning and Teaching Focus:</p> <p>In this unit, pupils learn the various aspects of energy and where it comes from. Learning about the formation of fossil fuels and the production of fuels from plants as well as renewables and non-renewable sources. We will also explore the use of plants to products such as medicines and cosmetics</p> <p>Specific topics include</p> <ul style="list-style-type: none"> • Fossil fuels and their extraction • Biofuels • Renewable energy • Hydrocarbons • Carbohydrates • Fermentation and alcohols • Plants to products 	<p>Learning and Teaching Focus:</p> <p>In this unit, pupils learn about all the resources, which come from the earth. Learning about materials and novel materials, about metals and how we have to extract them from the earth's crust, the use of metals to make batteries and natural and synthetic materials. We will also explore fertilisers and their advantages and disadvantages</p> <p>Specific topics include</p> <ul style="list-style-type: none"> • Materials • Novel materials • Reactions and extraction of metals • Corrosion • Making electricity • Plastics and their problems • Fertilisers • Nuclear chemistry
<p>Assessment Approach and evidence gathered:</p> <p>Pupils will be continually assessed in a number of practical areas including: safety in the lab, accuracy when carrying out experiments, problem solving skills and experimental design.</p> <p>Additionally evidence will be gathered in the form of written lab reports and an end of unit closed book assessment:</p> <p>Written Lab Write-up: Factor effecting rate of reaction Research Project: Effects of acid rain on the environment</p> <p><u>Home Learning Tasks</u></p> <p>Pupils will have a number written home learning tasks including</p> <p>Task 1: Rate of Reactions Task 2: Atomic Structure Task 3: Bonding and Structure Task 4: Chemical Formula 1 Task 5: Chemical Formula 2 Task 6: Acids and Bases Task 7: Whole Unit Revision</p>	<p>Assessment Approach and evidence gathered:</p> <p>Pupils will be continually assessed in a number of practical areas including: safety in the lab, accuracy when carrying out experiments, problem solving skills and experimental design.</p> <p>Additionally evidence will be gathered in the form of written lab reports and an end of unit closed book assessment:</p> <p>Written Lab Write-up: Energy released from alcohols Research Project: Plants to Products</p> <p><u>Home Learning Tasks</u></p> <p>Pupils will have a number written home learning tasks including</p> <p>Task 1: Fuels Task 2: Fractional Distillation Task 3: Alternative fuels Task 4: Carbohydrates Task 5: Plants to products Task 6: Whole Unit Revision</p>	<p>Assessment Approach and evidence gathered:</p> <p>Pupils will be continually assessed in a number of practical areas including: safety in the lab, accuracy when carrying out experiments, problem solving skills and experimental design.</p> <p>Additionally evidence will be gathered in the form of written lab reports and an end of unit closed book assessment:</p> <p>Written Lab Write-up: Metals vs Voltage in a cell Research Project: Overuse of Plastics in modern society</p> <p><u>Home Learning Tasks</u></p> <p>Pupils will have a number of research and written home learning tasks including</p> <p>Task 1: Reaction and Protection of metals Task 2: Extraction of metals Task 3: Simple cells Task 4: Plastics Task 5: Fertiliser Task 6: Nuclear Chemistry Task 7: Whole Unit Revision</p>

<p>Feedback linked to benchmarks</p> <ul style="list-style-type: none"> • Pupils will be able to identify key strengths and areas for improvement based on practical experimental skills • written feedback on lab reports • Verbal and written feedback from homework exercises and assessments within the class • Verbal feedback from classwork during lessons. 	<p>Feedback linked to benchmarks</p> <ul style="list-style-type: none"> • Pupils will be able to identify key strengths and areas for improvement based on practical experimental skills • written feedback on lab reports • Verbal and written feedback from homework exercises and assessments within the class • Verbal feedback from classwork during lessons. 	<p>Feedback linked to benchmarks</p> <ul style="list-style-type: none"> • Pupils will be able to identify key strengths and areas for improvement based on practical experimental skills • written feedback on lab reports • Verbal and written feedback from homework exercises and assessments within the class • Verbal feedback from classwork during lessons.
<p>Key Skills : Education Scotland BGE Science Benchmarks</p> <p>SCN 3-19a Through experimentation, I can identify indicators of chemical reactions having occurred. I can describe ways of controlling the rate of reactions and can relate my findings to the world around me.</p> <p>SCN 3-15a I have developed my knowledge of the Periodic Table by considering the properties and uses of a variety of elements relative to their positions.</p> <p>SCN 3-15b Having contributed to a variety of practical activities to make and break down compounds, I can describe examples of how the properties of compounds are different from their constituent elements.</p> <p>SCN 4-15a Through gaining an understanding of the structure of atoms and how they join, I can begin to connect the properties of substances with their possible structures.</p> <p>SCN 4-19a I can collect and analyse experimental data on chemical reactions that result in an obvious change in energy. I can apply my findings to explain the significance of the energy changes associated with chemical reactions.</p> <p>SCN 3-18a Having taken part in practical activities to compare the properties of acids and bases, I have demonstrated ways of measuring and adjusting pH and can describe the significance of pH in everyday life.</p> <p>Literacy: LIT 4-21a I can use a range of strategies and resources independently and ensure that my spelling, including specialist vocabulary, is accurate.</p> <p>HWB HWB 4-20a I am investigating different careers/occupations, ways of working, and learning and training paths. I am gaining experience that helps me recognise the relevance of my learning, skills and interests to my future life.</p> <p>Numeracy: MNU 4-03a: Having recognised similarities between new problems and problems I have solved before, I can carry out the necessary calculations to solve problems set in unfamiliar contexts.</p>	<p>Key Skills : Education Scotland BGE Science Benchmarks</p> <p>SCN 4-02b Through investigation, I can explain the formation and use of fossil fuels and contribute to discussions on the responsible use and conservation of finite resources.</p> <p>SCN 4-17a I have explored how different materials can be derived from crude oil and their uses. I can explain the importance of carbon compounds in our lives.</p> <p>SCN 4-18a I can monitor the environment by collecting and analysing samples. I can interpret the results to inform others about levels of pollution and express a considered opinion on how science can help to protect our environment.</p> <p>SCN 4-04a By contributing to an investigation on different ways of meeting society's energy needs, I can express an informed view on the risks and benefits of different energy sources, including those produced from plants.</p> <p>SCN 3-02a I can demonstrate my understanding of why plants are vital to sustaining life on Earth.</p> <p>Literacy: LIT 3-28a I can convey information, describe events, explain processes or concepts, and combine ideas in different ways.</p> <p>HWB HWB 3-38a Understand the positive effects that some substances can have on the mind and body but I am also aware of the negative and serious physical, mental, emotional, social and legal consequences of the misuse of substances.</p> <p>Numeracy: MTH 3-15b I can create and evaluate a simple formula representing information contained in a diagram, problem or statement.</p>	<p>Key Skills : Education Scotland BGE Science Benchmarks</p> <p>SCN 4-19b Having carried out a range of experiments using different chemicals, I can place metals in an order of reactivity, and relate my findings to their everyday uses.</p> <p>SCN 4-16a I have carried out research into novel materials and can begin to explain the scientific basis of their properties and discuss the possible impacts they may have on society.</p> <p>SCN 4-16b Through evaluation of experimental results, I can demonstrate my understanding of conservation of mass.</p> <p>SCN 4-03a Through investigating the nitrogen cycle and evaluating results from practical experiments, I can suggest a design for a fertiliser, taking account of its environmental impact.</p> <p>SCN 3-16a I can differentiate between pure substances and mixtures in common use and can select appropriate physical methods for separating mixtures into their components.</p> <p>Literacy: LIT 3-15a / LIT 4-15a I can make notes and organise them to develop my thinking, help retain and recall information, explore issues and create new texts, using my own words as appropriate.</p> <p>HWB HWB 3-20a I am investigating different careers/occupations, ways of working, and learning and training paths. I am gaining experience that helps me recognise the relevance of my learning, skills and interests to my future life.</p> <p>Numeracy: MTH 3-20b When analysing information or collecting data of my own, I can use my understanding of how bias may arise and how sample size can affect precision, to ensure that the data allows for fair conclusions to be drawn.</p>
<p>Skills for learning, work and life</p> <ul style="list-style-type: none"> • Enterprise Skills – Planning & Organising • Pupils will develop skills in team work and leadership by sharing tasks and responsibilities. • When carrying out research tasks, pupils will be able to demonstrate the ability to communicate in different ways and use technology for learning • Problem solving skills – throughout each unit pupils will be required to apply their knowledge to unfamiliar situations in order to solve problems. 		