



Dallam School

Curriculum Overview

Department: Chemistry
Year Group: 7

Autumn		Spring		Summer	
Particle model (6 lessons)	Separating mixtures (5 lessons)	Metals and non-metals (5 lessons)	Acids and alkalis (5 lessons)	Earth structure (4 lessons)	Universe (6 lessons)
Relate the features of the particle model to the properties of materials in different states	Devise ways to separate mixtures, based on their properties	Use experimental results to suggest an order of reactivity of various metals	Devise an enquiry to compare how well indigestion remedies work	Model the processes that are responsible for rock formation	Relate observations of changing day length to a model of the solar system
By the end of this topic pupils will know (<i>key knowledge, including tier 3 vocabulary</i>)					
<ul style="list-style-type: none"> ➤ Properties of solids, liquids and gases can be described in terms of particles in motion but with differences in the arrangement and movement of these same particles. ➤ Changes in temperature and changes of state can be described in terms of energy being shifted to or from particles. <p>Keywords</p> <ul style="list-style-type: none"> ➤ Diffusion ➤ Gas pressure ➤ Evaporate ➤ Boil ➤ Condense ➤ Melt ➤ Freeze ➤ Sublime 	<ul style="list-style-type: none"> ➤ A pure substance consists of only one type of element or compound and has a fixed melting / boiling points. Mixtures may be separated due to differences in their physical properties. ➤ The method chosen to separate a mixture depends on physical properties of the individual substances. <p>Keywords</p> <ul style="list-style-type: none"> ➤ Solvent ➤ Solute ➤ Dissolve ➤ Solution ➤ Filtration ➤ Distillation ➤ Evaporation ➤ Chromatography 	<ul style="list-style-type: none"> ➤ Metals and non-metals react with oxygen to form oxides. ➤ Metals can be arranged as a reactivity series. ➤ Some metals react with acids to produce salts and hydrogen. ➤ The names of the magnetic elements and elements that are liquid at room temperature. <p>Keywords</p> <ul style="list-style-type: none"> ➤ Metals ➤ Non-metals ➤ Displacement ➤ Oxidation ➤ Reactivity 	<ul style="list-style-type: none"> ➤ The pH of a solution depends on the strength of the acid. ➤ The pH of acids, neutral solutions and alkalis. ➤ The names of common strong and weak acids. ➤ Mixing an acid and alkali produces a chemical reaction, neutralisation, forming a salt and water. ➤ Acids and alkalis can be corrosive or irritant and require safe handling. <p>Keywords</p> <ul style="list-style-type: none"> ➤ pH ➤ Indicators ➤ Base ➤ Concentration 	<ul style="list-style-type: none"> ➤ Sedimentary, igneous and metamorphic rocks can be inter converted over millions of years through weathering and erosion, heat and pressure, and melting and cooling. ➤ The three rock layers inside Earth are the crust, the mantle and the core. <p>Keywords</p> <ul style="list-style-type: none"> ➤ Rock cycle ➤ Weathering ➤ Erosion ➤ Minerals ➤ Sedimentary rocks ➤ Igneous rocks ➤ Metamorphic rocks ➤ Strata 	<ul style="list-style-type: none"> ➤ The solar system can be modelled as planets rotating on tilted axes while orbiting the Sun. This explains day and year length, and seasons. ➤ Our solar system is a tiny part of a galaxy, one of many billions in the Universe. ➤ Light takes minutes to reach Earth from the Sun, four years from our nearest star and billions of years from other galaxies. <p>Keywords</p> <ul style="list-style-type: none"> ➤ Galaxy ➤ Light year ➤ Stars ➤ Orbit ➤ Exoplanet

Autumn		Spring		Summer	
Particle model (6 lessons)	Separating mixtures (5 lessons)	Metals and non-metals (5 lessons)	Acids and alkalis (5 lessons)	Earth structure (4 lessons)	Universe (6 lessons)
Relate the features of the particle model to the properties of materials in different states	Devise ways to separate mixtures, based on their properties	Use experimental results to suggest an order of reactivity of various metals	Devise an enquiry to compare how well indigestion remedies work	Model the processes that are responsible for rock formation	Relate observations of changing day length to a model of the solar system
They will understand (<i>key concepts</i>)					
<ul style="list-style-type: none"> ➤ How to explain the properties of solids, liquids and gases. ➤ How to draw before and after diagrams of particles to explain observations about changes of state, gas pressure and diffusion. 	<ul style="list-style-type: none"> ➤ How substances dissolve using the particle model. ➤ How to choose the most suitable technique to separate out a mixture of substances. 	<ul style="list-style-type: none"> ➤ How to describe an oxidation, displacement, or metal-acid reaction with a word equation. ➤ How to place an unfamiliar metal into the reactivity series based on information about its reactions. 	<ul style="list-style-type: none"> ➤ How to identify the best indicator to distinguish between solutions of different pH, using data provided. ➤ How to describe a method for how to make a neutral solution from an acid and alkali. 	<ul style="list-style-type: none"> ➤ How to explain why a rock has a particular property based on how it was formed. ➤ How to construct a labelled diagram to identify the processes of the rock cycle. 	<ul style="list-style-type: none"> ➤ How to explain why places on the Earth experience different daylight hours and amounts of sunlight during the year. ➤ How space exploration and observations of stars are affected by the scale of the universe.
They will know how to (<i>key skills</i>)					
<ul style="list-style-type: none"> ➤ Identify the variables from information about an investigation. ➤ Record the observation you want to explain. ➤ Identify features of an investigation which are hazardous. 	<ul style="list-style-type: none"> ➤ Use techniques to separate mixtures. ➤ Carry out the method carefully and consistently. 	<ul style="list-style-type: none"> ➤ Make conclusion and explain it. ➤ Design a table for the data being gathered. ➤ Make an experimental prediction. 	<ul style="list-style-type: none"> ➤ Decide the type of chart or graph to draw based on its purpose or type of data. ➤ Use scientific vocabulary accurately explain why the evidence supports your idea. 	<ul style="list-style-type: none"> ➤ Suggest ways to improve the method. ➤ Suggest a scientific reason for your findings. 	<ul style="list-style-type: none"> ➤ Comment on whether your findings fit with known scientific explanations. ➤ Record observations using scientific words. ➤ Identify a pattern in data from a results table or graph.



Dallam School

Curriculum Overview

Department: Chemistry
Year Group: 8

Autumn		Spring		Summer	
Periodic table (6 lessons)	Elements (5 lessons)	Chemical energy (5 lessons)	Types of reaction (5 lessons)	Climate (4 lessons)	Earth resources (6 lessons)
Sort elements using chemical data and relate this to their position in the periodic table	Compare the properties of elements with the properties of a compound formed from them	Investigate a phenomenon that relies on an exothermic or endothermic reaction	Investigate changes in mass for chemical and physical processes	Investigate the contribution that natural and human processes make to our carbon emissions	Predict the method used for extracting a metal based on its position in the reactivity series
By the end of this topic pupils will know (<i>key knowledge, including tier 3 vocabulary</i>)					
<p>➤ The elements in the periodic table are grouped to show a patterns in physical properties and reactivity.</p> <p>➤ Group 1 contains reactive metals called alkali metals.</p> <p>➤ Group 7 contains non-metals called halogens.</p> <p>➤ Group 0 contains unreactive gases called noble gases.</p> <p>Keywords</p> <ul style="list-style-type: none">➤ Periodic table➤ Physical properties➤ Chemical properties➤ Groups➤ Periods	<p>➤ Most substances are compounds or mixtures containing atoms of different elements. They have different properties to the elements they contain.</p> <p>➤ The symbols of common elements including hydrogen, oxygen, nitrogen, carbon, iron, copper, sulfur, aluminium, chlorine, sodium, potassium and magnesium.</p> <p>Keywords</p> <ul style="list-style-type: none">➤ <i>Elements</i>➤ <i>Atom</i>➤ <i>Molecules</i>➤ <i>Compound</i>➤ <i>Polymer</i>	<p>➤ During a chemical reaction bonds are broken (requiring energy) and new bonds formed.</p> <p>➤ Exothermic reactions release heat to the surroundings.</p> <p>➤ Endothermic reactions take in heat from the surroundings.</p> <p>Keywords</p> <ul style="list-style-type: none">➤ Catalysts➤ Exothermic reaction➤ Endothermic reaction➤ Chemical bond	<p>➤ Combustion is a reaction with oxygen in which energy is shifted to the surroundings.</p> <p>➤ Thermal decomposition is a reaction where reactant is broken down by heating.</p> <p>➤ Chemical changes can be described by a model where atoms in reactants rearrange to make the products and the total number of atoms is conserved.</p> <p>Keywords</p> <ul style="list-style-type: none">➤ Fuel➤ Chemical reaction➤ Physical change➤ Reactants➤ Products➤ Conserved	<p>➤ Carbon is recycled through natural processes in the atmosphere, ecosystems, oceans and the Earth's crust.</p> <p>➤ Greenhouse gases reduce the amount of energy lost from the Earth through radiation.</p> <p>➤ Methane and carbon dioxide are greenhouse gases.</p> <p>➤ The composition of the Earth's atmosphere.</p> <p>Keywords</p> <ul style="list-style-type: none">➤ Global warming➤ Fossil fuels➤ Carbon sink➤ Greenhouse effect	<p>➤ There is a finite amount of any resource on Earth.</p> <p>➤ Recycling reduces the need to extract resources.</p> <p>➤ Most metals are found combined with other elements, as a compound, in ores.</p> <p>➤ Carbon displaces less reactive metals from their compounds, while electrolysis is needed for more reactive metals.</p> <p>Keywords</p> <ul style="list-style-type: none">➤ Natural resources➤ Mineral➤ Ore➤ Extraction➤ Recycling➤ Electrolysis

Autumn		Spring		Summer	
Periodic table (6 lessons)	Elements (5 lessons)	Chemical energy (5 lessons)	Types of reaction (5 lessons)	Climate (4 lessons)	Earth resources (6 lessons)
Sort elements using chemical data and relate this to their position in the periodic table	Compare the properties of elements with the properties of a compound formed from them	Investigate a phenomenon that relies on an exothermic or endothermic reaction	Investigate changes in mass for chemical and physical processes	Investigate the contribution that natural and human processes make to our carbon emissions	Predict the method used for extracting a metal based on its position in the reactivity series
They will understand (<i>key concepts</i>)					
<ul style="list-style-type: none"> ➤ How to use data to describe a trend in physical properties. ➤ How to use observations of a pattern in chemical reactions to predict the behaviour of an element in a group. 	<ul style="list-style-type: none"> ➤ How to name compounds using their chemical formulae. ➤ How to represent atoms, molecules and elements, mixtures and compounds using particle diagrams. 	<ul style="list-style-type: none"> ➤ How to use experimental observations to distinguish exothermic and endothermic reactions. ➤ How to use a diagram of relative energy levels of particles to explain energy changes observed during a change of state. 	<ul style="list-style-type: none"> ➤ How to predict the products of the combustion or thermal decomposition of a given reactant and show the reaction as a word equation. ➤ How to use particle diagrams to show what happens in a reaction 	<ul style="list-style-type: none"> ➤ How to use a diagram to show how carbon is recycled in the environment and through living things. ➤ How human activities affect the carbon cycle. ➤ How global warming can impact on climate and local weather patterns. 	<ul style="list-style-type: none"> ➤ How Earth's resources are turned into useful materials or recycled. ➤ How to suggest factors to take into account when deciding whether extraction of a metal is practical.
They will know how to (<i>key skills</i>)					
<ul style="list-style-type: none"> ➤ Spot a data point that does not fit the pattern. ➤ Select a good way to display data. ➤ Use scientific vocabulary accurately. 	<ul style="list-style-type: none"> ➤ Use particle diagrams to classify a substance as an element, mixture or compound and as molecules or atoms. ➤ Name simple compounds ➤ Identify features of an investigation which are hazardous. 	<ul style="list-style-type: none"> ➤ Make conclusion and explain it. ➤ Choose a suitable range for the independent and dependent variable. ➤ Write a question linking variables in the form 'How does...affect...?' 	<ul style="list-style-type: none"> ➤ Write word equations from information about chemical reactions. ➤ Suggest ways to improve the method. ➤ Suggest a scientific reason for your findings. ➤ Use the measuring instrument correctly. 	<ul style="list-style-type: none"> ➤ Record observations using scientific words. ➤ List all the facts, scientific ideas, data, or conclusions that support your opinion. ➤ Describe possible consequences to animals dependent on these habitats. 	<ul style="list-style-type: none"> ➤ Carry out a method carefully and consistently. ➤ Identify features of an investigation which are hazardous.



Dallam School

Curriculum Overview

Department: Chemistry
Year Group: 9

Autumn		Spring		Summer
Atomic structure (6 lessons)	Periodic table (6 lessons)	Analysis (5 lessons)	Using hydrocarbons (4 lessons)	Acids and pH (7 lessons)
Use a model of the atom to represent the electronic structures of the first 20 elements	Explain the properties and reactions of elements in terms of their electronic structure	Use a range of separation techniques to analyse the chemical composition of mixtures and formulations	Examine the use of crude oil and its derivatives	Devise a method to prepare a pure dry sample of a salt.
By the end of this topic pupils will know <i>(key knowledge, including tier 3 vocabulary)</i>				
<ul style="list-style-type: none">➤ Atoms of elements and their isotopes are made up of differing numbers of three kinds of sub-atomic particle.➤ State symbols for chemical equations.➤ Mixtures can be separated by physical processes such as filtration, crystallisation, simple distillation, and chromatography.➤ Different models of the atom through history, and the key discoveries led to their development. <p>Keywords</p> <ul style="list-style-type: none">➤ nucleus➤ protons / neutrons / electrons➤ isotopes➤ atomic number➤ mass number➤ aqueous	<ul style="list-style-type: none">➤ The periodic table lists elements in order of their atomic number and groups elements with similar properties.➤ The reactions of alkali metals with oxygen, chlorine, and water.➤ The nature of compounds formed when bromine, chlorine, and iodine react with metals and non-metals.➤ The general properties of transition elements. <p>Keywords</p> <ul style="list-style-type: none">➤ Noble gas➤ transition element➤ alkali metal➤ reactive➤ halogen➤ displacement➤ shielding	<ul style="list-style-type: none">➤ The difference between a mixture and a formulation.➤ Chromatograms can be analysed quantitatively to identify compounds.➤ The different experimental tests for gases, including the procedure and positive result. <p>Keywords</p> <ul style="list-style-type: none">➤ purity➤ formulation➤ mobile phase➤ chromatography➤ chromatogram➤ retention factor	<ul style="list-style-type: none">➤ Crude oil is made up of a mixture of hydrocarbons called alkenes.➤ Large hydrocarbons can be broken into smaller molecules in a process called cracking.➤ The names, formula, properties, reactions, and uses of the homologous series known as alkanes and alkenes. <p>Keywords</p> <ul style="list-style-type: none">➤ (un)saturated➤ functional group➤ homologous series➤ colourless	<ul style="list-style-type: none">➤ The reactions of metals with water and acid.➤ Acids are neutralised by alkalis, bases, (and metal carbonates) to produce salts, water (and carbon dioxide).➤ The chemical formula of common ions.➤ The pH values associated with aqueous solutions of acids and alkalis.➤ The difference between strong and weak acids. <p>Keywords</p> <ul style="list-style-type: none">➤ reactivity series➤ neutralisation➤ salt➤ insoluble➤ base➤ neutral➤ carbonate➤ pH scale

Autumn		Spring		Summer	
Atomic structure (6 lessons)	Periodic table (6 lessons)	Analysis (5 lessons)	Using hydrocarbons (4 lessons)	Acids and pH (7 lessons)	
Use a model of the atom to represent the electronic structures of the first 20 elements	Explain the properties and reactions of elements in terms of their electronic structure	Use a range of separation techniques to analysis the chemical composition of mixtures and formulations	Examine the use of crude oil and its derivatives	Devise a method to prepare a pure dry sample of a salt.	
They will understand (<i>key concepts</i>)					
<ul style="list-style-type: none"> ➤ Why mass is conserved in a chemical reaction. ➤ How to use chemical symbols of atoms to write chemical formulae. ➤ How to explain the main processes occurring in paper chromatography and other separation techniques. ➤ Why the model of the atom has changed over time. ➤ How to use numbers and diagrams to represent the electronic structures of atoms and ions. 	<ul style="list-style-type: none"> ➤ Why the ordering of the elements in the periodic table has changed over time. ➤ How to use the periodic table to make predictions about the electronic structure and reactions of elements. ➤ How the properties and reactions of elements depends on their electronic structures. ➤ How a more reactive element can displace a less reactive one from its compound. 	<ul style="list-style-type: none"> ➤ How melting point and boiling point data can be used to determine the purity of a substance. ➤ Why different substances and different conditions will have different R_f values. ➤ How to interpret results to identify a gas that is present. 	<ul style="list-style-type: none"> ➤ How fractional distillation can be used to separate crude oil into fractions. ➤ The economic reasons for cracking long-chain hydrocarbons. ➤ The differences between complete and incomplete combustion of hydrocarbons. 	<ul style="list-style-type: none"> ➤ How to derive a reactivity series from experimental results and use this to make predictions. ➤ How to identify the chemical formula of the salt produced from the reaction between an acid and a metal. ➤ How pH relates to the H^+ ion concentration. ➤ How the reaction between ammonia and dilute acids to produce salts of importance to the agricultural sector 	
They will know how to (<i>key skills</i>)					
<ul style="list-style-type: none"> ➤ Write balanced symbol equations for chemical reactions. ➤ Use separation techniques such as filtration, distillation, and paper chromatography to separate mixtures. ➤ Recognise and use expressions in standard form. ➤ Make estimates of the results of simple calculations. 	<ul style="list-style-type: none"> ➤ Write word equations for chemical reactions. ➤ Write balanced symbol equations for chemical reactions. ➤ Safely observe chemical reactions and draw conclusions from their observations. ➤ Draw and interpret graphs and tables of properties of the elements (e.g. melting points, boiling points, density). 	<ul style="list-style-type: none"> ➤ Safely use a range of equipment to purify and/or separate chemical mixtures including chromatography. ➤ Interpret a chromatogram to identify unknown substances. ➤ Use ratios, fractions, and percentages. ➤ How to describe a method to produce a chromatogram. 	<ul style="list-style-type: none"> ➤ Draw the chemical structure of alkanes and alkenes. ➤ Write balanced symbol equations for the reactions of alkanes and alkenes. ➤ Test for the presence of unsaturated hydrocarbons. 	<ul style="list-style-type: none"> ➤ Write balanced symbol equations, with state symbols. ➤ Follow a method to prepare a pure, dry sample of a soluble salt from an insoluble substance and a dilute acid. ➤ Interpret the pH scale in terms of the changes in order of magnitude between each value. 	