

Westbourne Academy Curriculum Planning Document

Subject: Science Year: 7

Timescale	Autumn Term			
Prior Learning (from KS2/3)	Yrs 3-6 – Make observations, draw bar charts, , present data and draw simple conclusions	Yr 4 – The Digestive System Yr 5 – Importance of exercise & a balanced diet	Yr 5 – Planets, day & night	Yr 5 – Making solutions e.g. sugar dissolving in tea investigation
Unit Title	1. Scientific Skills	2. Nutrition, Digestion & Health	3. Space Physics	4. Pure & Impure Substances
Key knowledge (5-10 points)	<ol style="list-style-type: none"> 1. State the laboratory safety rules. 2. Identify commonly used laboratory equipment. 3. Light a Bunsen burner safely and use it to heat water. 4. State the three types of scientific variable and identify them in experiments. 5. Draw and label bar charts and line graphs. 6. Describe what a graph shows you. 7. Evaluate a set of scientific results. 8. Apply skills 4-7 by carrying out a scientific investigation. 	<ol style="list-style-type: none"> 1. State the 7 parts of a balanced diet. 2. Identify different people's energy needs. 3. State the causes and issues of obesity and starvation. 4. List some deficiency diseases and their symptoms. 5. State the parts and describe the functions of the digestive system. 6. Recall and explain the role of digestive enzymes. 7. Name some recreational drugs and their effects. 8. Outline the issues in society caused by addiction and substance misuse. 	<ol style="list-style-type: none"> 1. Define and calculate gravity. 2. Explain the difference between mass and weight. 3. Explain how the movement of the Earth causes days, nights and seasons. 4. Describe the phases of the Moon. 5. Name the planets in our Solar System. 6. Describe the life cycle of a star. 7. Define the term galaxy. 8. Explain the process of The Big Bang Theory and the evidence scientists have for it. 	<ol style="list-style-type: none"> 1. Define the terms element, mixture & compound. 2. Investigate filtration and evaporation. 3. Define the key terms associated with solutions. 4. Interpret solubility curves. 5. Investigate distillation and explain how it works. 6. Investigate chromatography and explain how it works.
Key skills (optional)				
Key terminology	<i>laboratory, safety, Bunsen burner, thermometer, independent, dependent, control, analysis, conclusion, evaluation</i>	<i>nutrient, balanced diet, kilojoules, obesity, starvation, deficiency disease, digestion, painkiller, stimulant, depressant</i>	<i>gravity, weight, Newton, planet, crescent, phases, protostar, nebula, supernova, galaxies</i>	<i>Element, compound, mixture, substance, symbol, filtration, evaporation, solution, dissolve, insoluble</i>
Assessment (methods to assess)	<ul style="list-style-type: none"> • Write up of scientific investigation 	<ul style="list-style-type: none"> • Year 6 Prior knowledge test • End of unit assessment /20 	<ul style="list-style-type: none"> • Year 6 Prior knowledge test • End of unit assessment /20 	<ul style="list-style-type: none"> • Year 6 Prior knowledge test • End of unit assessment /20
Links to other units in KS3/4.	<ul style="list-style-type: none"> • KS3 & KS4 (all units) 	<ul style="list-style-type: none"> • KS4 (Yr 9) Organisation (Digestive System & Digestive enzymes) • ELC Unit 1 The Human Body 	<ul style="list-style-type: none"> • KS3 (Yr 8) Forces & Equations (Weight, mass and gravity) • KS4 (Yr 10) Forces • KS4 Triple Science Space 	<ul style="list-style-type: none"> • KS3 (Yr 8) Atoms & The Periodic Table • KS4 (Yr 9) Atomic Structure & The Periodic Table • ELC Unit 3 Elements, Mixtures & Compounds

Timescale	Spring Term			
Prior Learning (from KS2/3)		Yr 4 – Solids, liquids & gases	Yr 4 – Sound & the ear Yr 5 – Properties of light waves	
Unit Title	1. Cells & Organisation	2. Particulate Nature of Matter	3. Light & Sound Waves	4. Acids & Alkalis
Key knowledge (5-10 points)	<ol style="list-style-type: none"> Set up and use a microscope. Compare the structures of typical plant and animal cells. Create a cheek cell and onion cell slide and identify the structures using a microscope. Understand how unicellular organisms carry out basic cell functions. Understand how multicellular organisms are set up. Understand the process of diffusion within cells. 	<ol style="list-style-type: none"> Identify substances as solids, liquids or gases. Use the particle theory to describe solids, liquids and gases. Describe changes of state. Define the term diffusion and investigate factors that affect its rate. Define the term Brownian motion and use it to describe particle movement. Define the term gas pressure. Calculate the density of some substances. Investigate factors that affect the rate of evaporation. 	<ol style="list-style-type: none"> Name the parts of longitudinal and transverse waves. Describe the properties of sound and light waves. Calculate the speed of sound in different materials. Name and locate the parts of the ear and the eye. Describe the differences between ultrasound and infrasound. Investigate reflection and refraction. Describe how humans see different colours. Investigate the use of photovoltaic cells. 	<ol style="list-style-type: none"> Identify the risks associated with using acids and alkalis. Use indicators to determine whether a substance is an acid or an alkali. Know the pH scale and use it to identify whether a substance is an acid, alkali or neutral. Understand what a neutralisation reaction is and give some examples in everyday use. Investigate neutralisation using indigestion remedies. Investigate the reactions of metals with acids.
Key skills (optional)				
Key terminology	<i>eye piece, objective, cytoplasm, nucleus, vacuole, organism, eukaryote, prokaryote, organelle, diffusion</i>	<i>arrangement, evaporation, condensation, melting, freezing, kinetic, diffusion, pressure, collisions, density</i>	<i>Light: transverse, luminous, translucent, opaque, transparent, reflection, incidence, refraction, spectrum, dispersion Sound: longitudinal, vibrations, amplitude, frequency, pitch, wavelength, cochlea, auditory, ultrasound, infrasound</i>	<i>acid, alkali, neutralisation, indicator, harmful, irritant, corrosive, salt, ions, reactivity</i>
Assessment (methods to assess)	<ul style="list-style-type: none"> Year 6 Prior knowledge test End of unit assessment /20 	<ul style="list-style-type: none"> Year 6 Prior knowledge test End of unit assessment /20 	<ul style="list-style-type: none"> Year 6 Prior knowledge test End of unit assessment /20 	<ul style="list-style-type: none"> Year 6 Prior knowledge test End of unit assessment /20
Links to other units in KS3/4.	<ul style="list-style-type: none"> KS4 (Yr 9) Cell Biology KS4 (Yr 9) Organisation ELC Unit 1 The Human Body 	<ul style="list-style-type: none"> KS3 (Yr 7) Cells & Organisation KS4 (Yr 10) Particle Model of Matter 	<ul style="list-style-type: none"> KS4 (Yr 10) Waves ELC Unit 6 Electricity, Magnetism & Waves 	<ul style="list-style-type: none"> KS4 (Yr 10) Chemical Changes ELC Unit 4 Chemistry in our World

Timescale	Summer Term			
Prior Learning (from KS2/3)	Yr 3 – Functions of the skeleton & how muscles help us move	Yrs 4 & 5 – Building electrical circuits	Yr 5 – Life cycles	Yr 5 – Forces (air resistance, friction)
Unit Title	1. Skeletal & Muscular Systems	2. Electricity	3. Reproduction	4. Forces
Key knowledge (5-10 points)	<ol style="list-style-type: none"> 1. State the structure and function of the skeleton. 2. Name the three types of joint and give examples of each. 3. Describe how problems can occur with joints. 4. Explain how muscles work in antagonistic pairs. 5. Investigate muscle strength. 	<ol style="list-style-type: none"> 1. Identify circuit symbols and build simple circuits. 2. Use models to explain how current flows around a circuit. 3. Measure current and voltage within a circuit. 4. Calculate resistance using the resistance equation. 5. Investigate the factors that affect the resistance in a wire. 6. State Ohms Law and explain how some components do not obey it. 7. Compare series and parallel circuits. 	<ol style="list-style-type: none"> 1. Name and locate the parts of the human reproductive system. 2. Explain what gametes are and the process of fertilisation. 3. Identify the structures involved in plant fertilisation. 4. Define the term gestation and explain how a human baby develops over 9 months. 5. State the key changes in males and females during puberty. 6. Explain how hormones control the menstrual cycle. 	<ol style="list-style-type: none"> 1. Name some forces and state whether they are contact or non-contact. 2. Describe the differences between balanced and unbalanced forces. 3. Investigate friction forces. 4. Investigate air resistance and describe how objects can be designed to reduce air resistance. 5. Investigate how density affects whether a substance will sink or float. 6. Calculate pressure using the pressure equation.
Key skills (optional)				
Key terminology	<i>skeleton, joint, muscle, antagonistic, contract, relax, cartilage, ligament, tendon, arthritis</i>	<i>circuit, insulator, conductor, battery, current, voltage, resistance, component, series, parallel</i>	<i>uterus, ovary, fertilisation, scrotum, testes, gamete, foetus, placenta, menstruation, ovulation</i>	<i>friction, resistance, upthrust, Newton, balanced, resultant, density, pressure, distance, aerodynamic</i>
Assessment (methods to assess)	<ul style="list-style-type: none"> • Year 6 Prior knowledge test • End of unit assessment /20 	<ul style="list-style-type: none"> • Year 6 Prior knowledge test • End of unit assessment /20 	<ul style="list-style-type: none"> • Year 6 Prior knowledge test • End of unit assessment /20 	<ul style="list-style-type: none"> • Year 6 Prior knowledge test • End of unit assessment /20
Links to other units in KS3/4.		<ul style="list-style-type: none"> • KS4 (Yr 10) Electricity • ELC Unit 6 Electricity, Magnetism & waves 	<ul style="list-style-type: none"> • KS3 (Yr 8) Genetics • KS4 (Yr 10) Inheritance, Variation & Evolution • ELC Unit 2 Environment, Evolution & Inheritance 	<ul style="list-style-type: none"> • KS3 (Yr 8) Forces & Equations • KS4 (Yr 10) Forces • ELC Unit 5 Energy, Forces & the Structure of Matter

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Subject: Science Year: 8



Timescale	Autumn			
Prior Learning (from KS2/3)	Year 7 – Cells and organisation, Reproduction	Year 7 – Pure and Impure Substances, Particulate Nature of Matter	Year 7 – Acids and alkalis	Year 7 - Forces
Unit Title	1. Genetics	2. Chemical Reactions and Equations	3. Earth and the Atmosphere	4. Forces and Equations
Key knowledge (5-10 points)	<ol style="list-style-type: none"> 1. Identify examples of inherited or environmental variation 2. Classify examples of variation as discontinuous or continuous 3. Describe how inheritance is controlled by our genes 4. Describe the structure of DNA 5. Explain how characteristics are inherited - Genetic Crosses 6. Describe the process of selective breeding 7. Identify species and Biodiversity 8. Recognise how organisms are placed into groups using classification systems 	<ol style="list-style-type: none"> 9. Recognise physical and chemical Reactions 10. Write word equations 11. Understand the law of Conservation of mass and write symbol equations 12. Describe the process of combustion 13. Describe the process of thermal decomposition 14. Identify what happens in oxidation reactions 15. Distinguish between endothermic and exothermic Reactions 	<ol style="list-style-type: none"> 1. Label the structure of Earth 2. Identify plate tectonics 3. Recognise gases in Earth's atmosphere 4. Recognise the impact of humans on air pollution 5. Describe how acid rain is formed and its consequences 6. Describe how greenhouse gases lead to global warming and explain the consequences 7. Describe the carbon cycle 	<ol style="list-style-type: none"> 1. Identify different forces 2. Describe how resultant forces affect the motion of an object 3. Understand the relationship between weight, mass & gravity 4. Calculate work done 5. Understand the relationship between force, mass & acceleration 6. Investigate Hooke's law 7. Interpret Distance-Time Graphs 8. Interpret Speed – Time Graphs 9. Calculate moments
Key skills (optional)				
Key terminology	<i>Species, biodiversity, variation, ecosystem, characteristic, continuous, discontinuous, inheritance, fertilisation, chromosome</i>	<i>Physical reaction, chemical reaction, reactant, product, reversible, combustion, decomposition, oxidation, exothermic, endothermic</i>	<i>Atmosphere, core, mantle, crust, tectonic plate, continent, volcano, combustion, pollution, climate, greenhouse gas, global warming, radiation</i>	<i>Stationary, resultant force, acceleration, vector, scalar, proportional, extension, deform, moment, equation</i>
Assessment (methods to assess)	<ul style="list-style-type: none"> • End of unit assessment /20 	<ul style="list-style-type: none"> • End of unit assessment /20 	<ul style="list-style-type: none"> • End of unit assessment /20 	<ul style="list-style-type: none"> • End of unit assessment /20

Links to other units in KS3/4.	<ul style="list-style-type: none"> Year 8 - Interactions and Evolution Year 9 – Cell Biology Year 10 – Infection and Response, Inheritance, variation and evolution Year 11 – Ecology ELC – The human body, Environment, evolution and inheritance 	<ul style="list-style-type: none"> Year 8 – Atoms, elements and the periodic table, Reactivity of metals Year 9 – Quantitative chemistry Year 10 – Chemical changes, Energy changes Year 11 – Organic chemistry, Chemistry of the atmosphere ELC – Chemistry in our world 	<ul style="list-style-type: none"> Year 8 –Plant Biology, Photosynthesis and respiration, Reactivity of metals Year 9 – Quantitative chemistry Year 10 – Chemical changes, Bioenergetics Year 11 – Organic chemistry, Chemistry of the atmosphere, Using resources ELC – Chemistry in our world 	<ul style="list-style-type: none"> Year 8 – Static electricity & Magnetism Year 10 – Forces Year 11 – Magnetism & Electromagnetism ELC – Energy, forces and matter
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Timescale	Spring			
Prior Learning (from KS2/3)	Year 7 – Cells and organisation	Year 7 – Pure and Impure Substances, Particulate Nature of Matter Year 8 – Chemical reactions and equations	Year 7 – Light and sound waves, Electricity	Year 7 - Forces
Unit Title	1. Plant Biology	2. Atoms, Elements and the Periodic Table	3. Energy	4. Static Electricity and Magnetism
Key knowledge (5-10 points)	<ol style="list-style-type: none"> Identify the various ways in which plants are essential to life on Earth Identify the reactants and products of photosynthesis Describe the structure of a leaf and explain how leaves are adapted for efficient photosynthesis Describe how the movement of gases into and out of a leaf is controlled by stomata Identify and then investigate factors that can affect the rate of photosynthesis Interpret graphs on limiting factors Explain how water and minerals move through a plant Identify minerals needed by plants and what happens if plants are deficient in these minerals 	<ol style="list-style-type: none"> Define and recognise examples of elements, mixtures and compounds Link properties of elements to their position on the periodic table Recognise that ideas on the structure of atoms has changed over time Identify structures within an atom Describe how electrons are arranged in different atoms Describe the properties of metals and non-metals Identify where alkali metals appear on the periodic table and describe similarities and differences in terms of structure and reactivity Identify the halogens on a periodic table and describe similarities and differences 	<ol style="list-style-type: none"> Recognise different forms of energy and energy transfer pathways Calculate energy efficiency and (some) display these using Sankey diagrams Label the parts of a power station and describe the main energy transfers in a power station Describe different forms of renewable and non-renewable energy Label parts of the National Grid and describe their purpose Define and calculate power Calculate the cost of using different electrical appliances Describe why we need energy and compare the energy requirements of different people 	<ol style="list-style-type: none"> Describe the effects of attraction and repulsion in relation to magnetic poles Describe the magnetic field of a bar magnet Describe Earth's magnetic field and explain its impact Describe how to make an electromagnet and investigate factors that affect their strength List some uses of electromagnets and describe the advantages of using electromagnets in comparison to permanent magnets Construct a simple electric motor Describe attraction and repulsion between statically charged objects

		in terms of structure and reactivity	9. Investigate energy in different types of food	8. Explain how static charges form using the flow of charges 9. Identify some uses of static electricity
Key skills (optional)				
Key terminology	<i>Photosynthesis, starch, glucose, cuticle, epidermis, palisade, chloroplast, chlorophyll, stomata, cellulose</i>	<i>Element. Atom, compound, mixture, molecule, periodic table, trend, group, nucleus, proton, neutron, electron, reactivity</i>	<i>Kinetic, store, transfer, efficiency, conservation, Sankey diagram, renewable, non-renewable, power, kilowatt-hour, appliance</i>	<i>Field, attraction, repulsion, poles, compass, electromagnet, current, permanent, induced, electrostatic</i>
Assessment (methods to assess)	<ul style="list-style-type: none"> End of unit assessment /20 	<ul style="list-style-type: none"> End of unit assessment /20 	<ul style="list-style-type: none"> End of unit assessment /20 	<ul style="list-style-type: none"> End of unit assessment /20
Links to other units in KS3/4.	<ul style="list-style-type: none"> Year 8 – Respiration and gas exchange Year 9 – Cell Biology, Organisation Year 10 – Bioenergetics Year 11 – Ecology ELC – The human body, Environment, evolution and inheritance 	<ul style="list-style-type: none"> Year 8 – Reactivity of metals Year 9 – Atomic structure and the periodic table, Bonding, structure and the properties of matter, Quantitative chemistry Year 10 – Chemical changes, Energy changes Year 11 – Organic chemistry, Chemistry of the atmosphere, Chemical analysis ELC – Chemistry in our world 	<ul style="list-style-type: none"> Year 9 – Energy Year 10 – Waves ELC – Energy, forces and matter, Electricity, magnetism and waves 	<ul style="list-style-type: none"> Year 9 – Electricity Year 11 – Magnetism & Electromagnetism ELC – Electricity, magnetism and waves

Timescale	Summer			
Prior Learning (from KS2/3)	Year 7 – Cells and organisation, Nutrition, digestion and health, Skeletal and muscular systems	Year 7 – Cells and organisation Year 8 – Plant biology, Genetics	Year 7 – Pure and impure substances, Particulate nature of matter, Acids and alkalis Year 8 – Chemical reactions and equations, Atoms. Elements and the periodic table	
Unit Title	1. Respiration and Gas Exchange	2. Interactions and Evolution	3. Reactivity of Metals	

Key knowledge (5-10 points)	<ol style="list-style-type: none"> 1. Explain how changes in volume and pressure inside the chest move gases in and out of the lungs 2. Describe simple ways of measuring lung volume 3. Explain how the parts of the gas exchange system are adapted to their function. 4. Explain how exercise, smoking and asthma affect the gas exchange system. 5. Recall the equation for respiration and explain the importance of respiration in living organisms 6. Analyse experimental evidence for respiration 7. Describe where in the cell respiration takes place 8. Describe anaerobic respiration and suggest when this takes place 9. Describe the process of fermentation and give examples of uses in industry 	<ol style="list-style-type: none"> 1. Draw food chains and interpret food webs 2. Construct and interpret pyramids of number and biomass 3. Describe and explain the relationship between predator-prey populations 4. Describe how toxins can pass along a food chain 5. Identify generalist and specialist species and outline the advantages/disadvantages of each type 6. Identify how different organisms are adapted to their environment 7. Explain how adaptations enable organisms to survive in their environment 8. Explain the process of natural selection 9. Explain why species have become endangered or extinct 	<ol style="list-style-type: none"> 1. Identify common metals and link their properties to their uses 2. Select metals most appropriate for a particular use and justify the selection 3. Place metals in order of their reactivity 4. Describe what happens when a metal is displaced from a compound and predict reactions using the reactivity series 5. Recall that most metals are found combined with other elements, as a compound, in ores 6. Recall what is meant by the process of oxidation 7. Recall that the more reactive a metal, the more difficult it is to separate it from its compound 8. Recall that carbon displaces less reactive metals, while electrolysis is needed for more reactive metals 9. Justify the choice of extraction method for a metal, given data about reactivity 	
Key skills (optional)				
Key terminology	<i>Diaphragm, intercostal, trachea, bronchi, bronchioles, alveoli, capillary, respiration, mitochondria, fermentation</i>	<i>Producer, consumer, biomass, bioaccumulation, generalist, specialist, adaptation, evolution, natural selection, endangered, extinction</i>	<i>Extracting, ore, electrolysis, oxidation, displacement, salt, corrosion, malleable, mineral, extraction, recycling</i>	
Assessment (methods to assess)	<ul style="list-style-type: none"> • End of unit assessment /20 	<ul style="list-style-type: none"> • End of unit assessment /20 	<ul style="list-style-type: none"> • End of unit assessment /20 	

Links to other units in KS3/4.	<ul style="list-style-type: none"> • Year 9 – Cell Biology, Organisation • Year 10 – Bioenergetics, Homeostasis and response • ELC – The human body 	<ul style="list-style-type: none"> • Year 9 – Cell biology, Organisation • Year 10 – Infection and response, Bioenergetics, Inheritance, variation and evolution • Year 11 – Ecology • ELC – Environment, evolution and inheritance 	<ul style="list-style-type: none"> • Year 9 – Atomic structure and the Periodic Table, Bonding, structure and the properties of matter, Quantitative chemistry • Year 10 – Chemical changes, Energy changes • Year 11 – Using resources • ELC – Elements, mixtures and compounds, Chemistry in our world 	
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Westbourne Academy Curriculum Planning Document

Subject: Science Year: 9

Timescale	Term 1		
Prior Learning (from KS2/3)	Yr 7 - Pure and Impure substances Yr 8 - Atoms, Elements & the Periodic Table	Yr 7 - Cells and Organisation Yr 8 - Plant Biology & Genetics	Yr 8 – Forces & Equations & Energy
Unit Title	1. Atomic structure and the Periodic Table	2. Cell Biology	3. Energy
Key knowledge (5-10 points)	<ol style="list-style-type: none"> Identify the composition of a compound from both its name and symbol. Describe some methods of separating mixtures. Outline the history of the atom. Describe atomic structure and state the numbers of protons, neutrons and electrons, in a given element. Draw the electron structure of the first 20 elements. Outline the history of the Periodic Table. Compare the chemical and physical properties of metals and non-metals. Identify and describe some properties of the elements in Group 0, Group 1 and Group 7. 	<ol style="list-style-type: none"> Identify and give the functions of the components of a typical animal and plant cell. Name the components of a microscope and be able to prepare a microscope slide. Compare the light and electron microscopes and appreciate their role in understanding microscopic structures. Compare and contrast prokaryotic and eukaryotic cells. Name and Identify specialised cells. Describe the organisation of an organism with respect to cells, tissues, organs and organ systems. Explain the stages involved in mitosis. Describe and evaluate the use of stem cells in modern society and the ethical implications of their use. Outline the three types of cell transport and give examples of their use in animals and plants. 	<ol style="list-style-type: none"> Define and calculate: gravitational potential energy, kinetic energy and elastic potential energy. Define and calculate power. Define and calculate specific heat capacity. Apply the concept of specific heat capacity to everyday situations. Explain how energy is lost (dissipated) from a house and describe ways to reduce this energy loss. Calculate the energy efficiency of an electrical appliance. Draw and interpret Sankey diagrams. Distinguish between renewable and non-renewable resources and give examples of each. Outline some advantages and disadvantages of their use. Formulate and give reasons for a future global energy plan.
Key skills (optional)			
Key terminology	<i>atom, element, compound, mixture, electron, neutron, proton, nucleus, shell, atomic number, mass number, ion, isotope, group, period</i>	<i>eukaryotes, prokaryotes, mitochondria, ribosomes, chloroplasts, magnification, specialised, differentiation, resolution, chromosomes, genes, mitosis, diffusion, osmosis, active transport</i>	<i>system, work done, kinetic, elastic potential, lubrication, limit of proportionality, gravitational potential, gravitational field strength, efficiency, power, spring constant, insulation, specific heat capacity, renewable, non-renewable</i>
Assessment (methods to assess)	<ul style="list-style-type: none"> ATT End of Unit Assessment / 45 	<ul style="list-style-type: none"> ATT End of unit assessment / 45 	<ul style="list-style-type: none"> ATT End of unit assessment / 45
Links to other units in KS3/4.	<ul style="list-style-type: none"> KS4 Structure & Bonding (Yr 9) KS4 Quantitative chemistry (Yr 10) 	<ul style="list-style-type: none"> KS4 Organisation (Yr 9) KS4 Inheritance, Variation & Evolution (Yr 10) ELC Unit 1 The Human Body & Unit 2 Environment, Inheritance & Evolution 	<ul style="list-style-type: none"> KS4 Forces (Yr 10) ELC Unit 5 Energy, Forces & their Structure of Matter KS4 Space Physics (Triple content only)

Westbourne Academy Curriculum Planning Document

Subject: Science Year: 9

Timescale	Term 2		
Prior Learning (from KS2/3)	Yr 7 - Pure & Impure Substances Yr 8 - Atoms, Elements & the Periodic Table Yr 8 - Earth & Atmosphere Yr 8 - Chemical Reactions & equations	Yr 7 - Cells and Organisation & Nutrition, Digestion & Health Yr 8 - Plant Biology & Respiration and Gas Exchange	KS2 – Year 4 – Solids, liquids and gases KS3 – Year 7 – classifying solids, liquids, gases, changing state, gas pressure, density, kinetic theory
Unit Title	4. Bonding, Structure & the Properties of Matter 1 5. Chemistry of the Atmosphere 1	6. Organisation	7. Particle Model of Matter
Key knowledge (5-10 points)	Bonding, Structure & the Properties of Matter <ol style="list-style-type: none"> 1. Name and describe the three types of bonding: ionic, covalent and metallic. Chemistry of the Atmosphere <ol style="list-style-type: none"> 1. Describe the composition of the atmosphere. 2. Describe the theory of the evolution of the Earth's early atmosphere. 3. Describe the main changes in the atmosphere over time and the likely causes of these changes. 4. Describe how greenhouse gases are produced. 5. Describe four potential effects of global climate change. 	<ol style="list-style-type: none"> 1. Understand how a multicellular organism is organised (cell, tissue, organ, organ system). 2. Name, locate and state the functions of the organs in the digestive system. 3. Describe the properties of enzymes and how they aid digestion. 4. Investigate and describe the effects of pH and temperature on digestive enzymes. 5. Name, locate and state the functions of the structures within the circulatory and respiratory systems. 6. Describe the composition of the blood and the vessels that transport it around the body. 7. State some conditions associated with the heart and their treatments. 8. Outline the differences between communicable and non-communicable diseases. 9. Name, locate and state the functions of the plant organs – root, leaf, stem (xylem & phloem) and flower. 10. Describe how water and minerals are transported into and around a plant. 	<ol style="list-style-type: none"> 1. Calculate the density of a material using density = mass / volume. 2. Describe how to find the density of both regular and irregular objects. 3. Use particle ideas to explain the differences in densities between solids, liquids and gases. 4. Know that when a substance changes state, mass is conserved and the temperature does not change. 5. Describe what is meant by 'internal energy'. 6. Define specific heat capacity. 7. Carry out calculations using the specific heat capacity equation. 8. Define specific latent heat. 9. Use E=mc² to calculate energy, mass or specific latent heat. 10. Explain what is meant by gas pressure and how temperature can affect it.
Key skills (optional)			
Key terminology	<i>ionic, covalent, metallic, Atmosphere, volcanic activity, photosynthesis, dissolves, precipitated, non-renewable, heat, pressure, fossil fuels, deforestation, climate science, greenhouse effect, global warming, climate change, carbon dioxide, water vapour, methane,</i>	<i>enzyme, bile, emulsify, arteries, veins, capillaries, stent, coronary artery, statin, risk factor, benign, malignant, epidermis, palisade, spongy, xylem, phloem, meristem, stomata, transpiration, translocation</i>	<i>Density, mass, volume, particles, force of attraction, solid, liquid, gas, temperature, pressure, internal energy, specific latent heat, kinetic energy, potential energy, change of state, specific latent heat of fusion, specific latent heat of vapourisation</i>
Assessment (methods to assess)	<ul style="list-style-type: none"> Westbourne Multiple Choice Assessment / 20 	<ul style="list-style-type: none"> ATT End of Unit Assessment / 45 	<ul style="list-style-type: none"> ATT End of Unit Assessment / 45
Links to other units in KS3/4.	<ul style="list-style-type: none"> KS4 Particle Model of Matter ELC Unit 3 Elements, Mixtures & Compounds 	<ul style="list-style-type: none"> KS4 Cell Biology KS4 Infection & Response ELC Unit 1 The Human Body 	<ul style="list-style-type: none"> KS3 – Year 7 – Particulate Nature of Matter KS4 Energy Unit

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Subject: Science Year: 9

Timescale	Term 3		
Prior Learning (from KS2/3)	KS3 - Year 8 – writing word and symbol equations, describing the process of combustion.	KS3 - Year 7 – use of indicators, classifying acids and alkalis, pH scale, neutralisation and its uses. Reaction of metals with acids. KS3 - Year 8 – reactivity series, reactions of metals, introduction to electrolysis, extraction of metals.	Yr 7 – Electricity Yr 8 - Energy
Unit Title	8. Organic Chemistry	9. Chemical Changes Part 1	10. Electricity Part 1
Key knowledge (5-10 points)	<ol style="list-style-type: none"> 1. Recognise substances as alkanes given their molecular or structural formulae. 2. Describe the formation and composition of crude oil. 3. Describe the process of fractional distillation. 4. Know the trends in properties of the alkanes and explain these in relation to intermolecular forces. 5. Describe and explain the process of cracking. 	<ol style="list-style-type: none"> 1. Explain the terms reduction and oxidation. 2. Describe the reactions of metals with water and dilute acid. 3. Know how metals can be extracted from their ores by reduction using carbon. 4. Write ionic equations for displacement reactions (HIGHER only) 5. Know how acids react with alkalis, metals, bases and metal carbonates to form salts. 6. Describe how to make a pure, dry sample of a soluble salt. 7. Use the pH scale to identify acidic or alkaline solutions. 8. Distinguish between the terms: concentrated, dilute, weak and strong when describing acids. (HIGHER only) 	<ol style="list-style-type: none"> 1. Identify circuit symbols and build circuits from diagrams. 2. Evaluate electrical models in terms of how useful they are to explain current flow. 3. Compare series and parallel circuits (current, voltage and resistance). 4. Investigate and calculate resistance in a wire. 5. Outline the differences between direct and alternating current. 6. Explain how a plug is wired and the electrical safety features used around a home. 7. Calculate power using three equations: $E=Pt$, $P=IV$ and $P=I^2R$. 8. Explain how a power station generates electricity. 9. Explain how the National Grid carries electricity from a power station to homes and businesses.
Key skills (optional)			
Key terminology	<i>Crude oil, hydrocarbons, non-renewable, fossil fuels, alkanes, homologous series, formula, saturated, unsaturated, fractional distillation, fractionating column, chain length, intermolecular forces, complete combustion, incomplete combustion, structural formula, molecular formula, catalytic cracking, steam cracking, thermal decomposition, alkene, polymers, boiling point, viscosity, flammability</i>	<i>Reactivity series, neutralisation, redox reaction, reduction, oxidation, acids, bases, alkalis, hydrogen ions, hydroxide ions, dissociates, reversible, electrolysis, electrolyte, electrodes, anode, cathode, inert, half equation</i>	<i>Diode, thermistor, resistor, charge, current, resistance, potential difference, non-ohmic, series, parallel, direct current, alternating current, power, National grid, transformer</i>
Assessment (methods to assess)	Trust common End of Unit Assessment Test / 45	<ul style="list-style-type: none"> • Westbourne Multiple Choice Test / 20 	<ul style="list-style-type: none"> • Westbourne Multiple Choice Test /20
Links to other units in KS3/4.	<ul style="list-style-type: none"> • KS3 – Year 8 - Chemical reactions and equations • ELC Unit 3 – Elements, Mixtures and Compounds • ELC Unit 4 – Chemistry in Our World 	<ul style="list-style-type: none"> • KS3 – Year 7 – Acids and Alkalis • KS3 – Year 8 – Reactivity of metals • ELC Unit 4 – Chemistry in Our World 	<ul style="list-style-type: none"> • ELC Unit 6 Electricity, Magnetism & Forces