



Through our science curriculum pupils recognise that science is a fundamental aspect of modern society and an essential part of a well-rounded education. We develop pupils to understand the natural world and how it works, to develop critical thinking skills, to apply scientific knowledge and to solve real-world problems. Our curriculum helps pupils to develop an understanding of the basic principles of science, including scientific method, the nature of scientific inquiry, and the role of evidence in scientific discovery. It promotes critical thinking skills by encouraging pupils to ask questions, analyse data, and evaluate evidence to form evidence-based conclusions. It fosters creativity, encourages pupils to think creatively and to develop innovative solutions to complex problems and find ways to apply them in the real world. Our science curriculum is essential for equipping pupils with the knowledge, skills, and attitudes needed to understand and engage with the scientific world and to contribute to the development of a scientifically literate society.

Year 7 Curriculum #1						
Learning Focus	Cells	Particles and Behaviour	Forces	Structure and function of body systems	Elements, Atoms and Compounds	Sound
Learning Hours Associated	Week 1- Week 3.5 Approx 8 hours	Week 3.5- Week 6.5 Approx 10 hours	Week 6.5 – Week 9 Approx 8 hours	Week 9 – Week 12 Approx 9 hours	Week 16 – Week 18 Approx 7 hours	Week 18 – Week 20 Approx 8 hours
What pupils will know, understand and be able to do.	<ul style="list-style-type: none"> ✓ To know how to use a microscope to observe cells. ✓ To know the structure and function of animal and plant cells. ✓ To understand structural adaptation of specialised cells and unicellular organisms 	<ul style="list-style-type: none"> ✓ To know definitions of material and substance. ✓ To know factors in the particle model that determine the properties of substances. ✓ To understand properties of substances in different states. ✓ To understand particle arrangement, separation and movement in different states. 	<ul style="list-style-type: none"> ✓ Use force arrows to explain how forces arise. ✓ Compare everyday contact and non-contact forces. ✓ Understand how to measure forces and give the unit of force. ✓ Understand how forces deform objects. ✓ Understand how solid surfaces provide a support force. ✓ Apply Hooke's law. 	<ul style="list-style-type: none"> ✓ Define tissue, organs, organ system. ✓ Understand the hierarchy of organisation in a multicellular organism. ✓ Define the process of gas exchange. ✓ Understand how parts of the gas exchange system are adapted to their function. ✓ Compare the composition of inhaled and exhaled air. 	<ul style="list-style-type: none"> ✓ State the definition of an element and list some examples of elements. ✓ Describe what the Periodic table shows and use it to find a named element. ✓ State the meaning of the word 'atom'. ✓ State the meaning of the word 'element'. ✓ State the meaning of the word 'compound'. ✓ Explain whether a molecule diagram 	<ul style="list-style-type: none"> ✓ Describe the properties of waves. ✓ Describe how waves are superposed and reflected. ✓ Describe how sound is produced and travels. ✓ Use the particle model to explain why the speed of sound is different in different materials. ✓ Describe the link between loudness and amplitude of sound waves.

	<ul style="list-style-type: none"> ✓ To understand the role and process of diffusion 	<ul style="list-style-type: none"> ✓ To understand the concept of density and states of matter. ✓ To understand how particles behave when changing state. ✓ To understand different melting and boiling points. ✓ To know the process of diffusion 	<ul style="list-style-type: none"> ✓ Understand the effects of drag forces and friction. ✓ Understand how drag forces and friction arise. ✓ Understand how drag forces and friction can be reduced. ✓ Understand the effects of gravitational, magnetic and electric fields. ✓ Describe the difference between weight and mass. ✓ Calculate weight using $W=mg$ on the Earth, planets and the Moon. ✓ Understand the difference between balanced and unbalanced forces. ✓ Understand why an object is in equilibrium. ✓ Understand the changing motion of objects. 	<ul style="list-style-type: none"> ✓ Understand the changes that occur when a person exhales and inhales. ✓ Understand how a bell jar can be used to model breathing. ✓ Understand the method used to estimate lung volume. ✓ Identify the main bones in the human skeleton. ✓ Understand the structure of a bone. ✓ Understand the functions of the skeletal system. ✓ Understand the role of joints in movement. ✓ Understand the structure of a joint, ✓ Understand how to measure the force exerted by the different muscles. ✓ Understand the function of the major muscle groups. ✓ Understand how muscles cause movement in the body. ✓ Understand how antagonistic muscles control 	<p>shows and element or a compound.</p> <ul style="list-style-type: none"> ✓ Explain why a compound has different properties to the elements whose atoms are in it. ✓ Name familiar two-element compounds. ✓ Determine the chemical formula of a compound given the relative numbers of atoms of the elements in it. 	<ul style="list-style-type: none"> ✓ Describe the link between the frequency and pitch of sound waves. ✓ Describe how the ear works. ✓ Compare the range of human and animal hearing. ✓ Describe how a simple microphone works. ✓ Explain how echoes are used to find distance. ✓ Describe uses of ultrasound. ✓ Compare sound and ultrasound.
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				movement at a joint.		
Subject Vocabulary	Tier 2 - Subjective, Objective Tier 3 – Lens, Membrane, mitochondria, vacuole, cytoplasm, chloroplast, flaccid, permeable, flagellum, amoeba	Tier 2 - Property, mixture, substance, reversible, random, concentration Tier 3 - Density, volume, state, physical, chemical, conservation	Tier 2 – compare, contact, friction, measure, non-contact, pull, push, results, sketch, axes, compress, deform, extension, linear, scales, stretch, tension, variable, control, dependent, independent, lubrication, streamlined, field, mass, weight. Tier 3 – air resistance force arrows, gravity, interaction, magnetic, newton(N), Newtonmeter, line of best fit, drag, electrostatic, kilogram (kg)	Tier 2 – cell, function, hierarchy, level, organism, tissue, condense, elastic, exhale, inhale, lungs, pressure, volume, function, movement, protection, flexible, joint, rigid, contract Tier 3 – circulatory, digestive, multicellular, organ, reproductive, respiratory, specialised, xylem, alveolus, bronchiole, bronchus, carbon dioxide, ribcage, trachea, asthma, diaphragm, marrow, biomechanics, cartilage, ligament, antagonistic, biceps, tendon, triceps	Tier 2 – Element, Substance, Mass, particle, properties, compound, relative Tier 3 – Group, Period, Atom, Molecule, formula,	Tier 2 – Amplitude, frequency, loudness, microphone, pitch, medium, vibrations, amplify, audible, eardrum, echo, image, pulse, receiver, reflect, scan Tier 3 – Decibel, Hertz, kilohertz, oscilloscope, Vacuum, auditory, canal, nerverm cochlea, diaphragm, ossicle, pinna, semi-circular canals, ultrasound, sonar, transmitter
Subject Texts Used	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/how-can-we-grow-models-of-embryos-in-the-lab/ A Short History of Nearly Everything – Bill Bryson	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/can-materials-made-of-the-same-elements-have-different-properties/ A Short History of Nearly Everything – Bill Bryson	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/why-do-ducklings-swim-in-a-line-behind-their-mother/ What if? – Randall Munroe Science matters – Robert M Hazen	Oxford smart active kerboodle https://www.sciencejournalforkids.org/articles/can-armadillos-show-us-how-to-regrow-a-liver/ The Body – Bill Bryson The immortal life of Henrietta Lacks – Rebecca Skloot	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/what-can-we-learn-from-carbon-on-mars/ Maguc Furnace – Marcus Chown The disappearing spoon – Sam Kean Reactions – Theoodre Gray A Short History of nearly everything – Bill Byrson	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/why-do-bats-need-more-food-to-call-louder/ The Body – Bill Bryson
Cultural Enrichment Opportunities	Body works video clips	Practical work, modelling,	Science and industry museum visit – use of	Practical work, modelling Bodyworks video clips	Practical work, modelling,	Practical work, Modelling, Eureka Halifax Science trip,

	<p>Children's science Christmas lectures Eureka Wallesey Trip Stem Ambassadors Visit / virtual Q&A</p>		<p>forces in industrial machinery.</p>	<p>Bodyworks Science Trip Eureka Wallesy Trip Stem Ambassadors – Surgeon or Medical Professional Surgery Live sessions in School</p>	<p>MOSI visit, History of Manchester in atomic discovery BBC Bitesize animatons,</p>	<p>STEM ambassadors – audiologist visit/speech,</p>
<p>Learning Behaviours</p>	<p>Safe working - Microscopes practical making and viewing slides Observation Tracking Teacher in class, viewing slides using a microscope Following instructions When carrying out tasks assigned by your teacher Purposeful Conversation When talking with a partner or in a group about learning focus Creative Thinking When applying knowledge to unfamiliar situations</p>	<p>Safe Working - Practical Work in Science Lab Active Listening- Listening to staff and other students to develop knowledge of key concepts Problem Solving - Quizzes, group tasks, comprehension tasks Creative Thinking - Making models, cartoon strips</p>	<p>Safe Working - Practical Work in Science Lab Observation- Tracking staff when demonstrating practical. Noting observations when performing practical activity Following instructions - When carrying out tasks assigned by teacher. Active Listening- Listening to staff and other students to develop knowledge of key concepts Problem Solving - Quizzes, group tasks, comprehension tasks Creative Thinking - Situations where force applies – naming all forces. Situations where forces does not apply.</p>	<p>Safe Working - Practical Work in Science Lab Active Listening- Listening to staff and other students to develop knowledge of key concepts Problem Solving - Quizzes, group tasks, comprehension tasks Creative Thinking - Making models, cartoon strips</p>	<p>during the school day. Safe Working - Practical Work in Science Lab, Active Listening - Listening to staff and other students to develop knowledge of key concepts, Problem Solving - Quizzes, group tasks, comprehension tasks, Creative Thinking - Making models, cartoon strips,</p>	<p>Safe Working - Practical Work in Science Lab, Active Listening - Listening to staff and other students to develop knowledge of key concepts, Problem Solving - Quizzes, group tasks, comprehension tasks, Creative Thinking - Making models, cartoon strips,</p>

Year 7 Curriculum #2

Learning Focus	Reproduction	Light	Reactions	Acids and alkalis	Space	Health and lifestyle
Learning Hours Associated	(Week 20 – Week 24) Approx 11 hours	(Week 24 – Week 26) Approx 8 hours	(Week 27 – Week 30) Approx 8 hours	(Week 30 – Week 32) Approx 7 hours	(Week 32 – Week 34) Approx 7 hours	(Week 34 – Week 39) Approx 11 hours
What pupils will know, understand and be able to do.	<ul style="list-style-type: none"> ✓ Describe the difference between adolescence and puberty. ✓ Compare the physical changes in males and females during puberty. ✓ Describe the role of sex hormones during puberty. ✓ Describe the biological function of the male and female reproductive system. ✓ Label the main structures in the male and female reproductive system. ✓ Describe the biological function of the main structures in the male and female reproductive system. 	<ul style="list-style-type: none"> ✓ Describe the journey light takes. ✓ Describe how the speed of light is used to define distance. ✓ Describe what can happen when light is reflected. ✓ Explain how images are formed in a plane mirror. ✓ Describe and explain what happens when light changes direction. ✓ Describe how a convex lens affects light. ✓ Describe how the eye works. ✓ Compare a simple camera with the eye. ✓ Describe how primary colours add to make secondary colours. ✓ Describe and explain the effects of prisms, filters and 	<ul style="list-style-type: none"> ✓ Give the definition of a chemical reaction. ✓ Explain how chemical reactions are useful. ✓ Compare chemical reactions to physical reactions. ✓ Identify reactants and products in word equations. ✓ Write word equations for chemical reactions, given the reactants and the products. ✓ Given a particle diagram for a chemical reaction involving molecules, explain how the atoms are rearranged and join differently together. ✓ Give the definitions of a combustion reaction and oxidation reaction. ✓ Write word equations for 	<ul style="list-style-type: none"> ✓ Describe the hazards linked to using laboratory acids and alkalis and how to control the risks from hazards. ✓ Use the particle model to describe differences between concentrated and dilute solutions. ✓ Given the colour change on adding indicator, determine whether a solution is acidic or alkaline. ✓ Identify acids, alkalis and neutral solutions on the pH scale. ✓ Use universal indicator to measure the pH of a solution. ✓ Give the definitions of base and alkali. ✓ Describe how pH changes in 	<ul style="list-style-type: none"> ✓ Describe the objects that you can see in the night sky with the naked eye and with a telescope. ✓ Describe the structure of the Universe. ✓ Compare the planets of the Solar System. ✓ Describe how the Solar System formed. ✓ Explain the apparent motion of the Sun and other objects in the sky. ✓ Describe and explain seasonal changes in the UK. ✓ Describe seasonal changes in different places on Earth. ✓ Describe the phases of the Moon. ✓ Explain why you see phases of the Moon. 	<ul style="list-style-type: none"> ✓ Give the definition of a balanced diet. ✓ Name the seven components of a balanced diet, giving examples. ✓ Describe the role of each component of a balanced diet. ✓ Name the chemicals used to test foods for starch, lipids, sugar and protein. ✓ Give the positive result for each food test. ✓ Describe how to test for starch, lipids, sugar and protein. ✓ Describe some health issues caused by an unhealthy diet. ✓ Give the definition of a vitamin or mineral deficiency. ✓ Compare the energy requirements of different people.

	<ul style="list-style-type: none"> ✓ Describe the process of fertilisation. ✓ Describe what happens during sexual intercourse. ✓ Describe the main steps that must take place for implantation to occur. ✓ Describe what is meant by the term gestation. ✓ Describe the function of the placenta, umbilical cord and fluid sac. ✓ Describe the main stages in the process of birth. ✓ Describe what happens during a period. ✓ Describe the main stages in the menstrual cycle. ✓ Describe some different methods of contraception. ✓ Describe the functions of the main structures in a flower. ✓ Describe the process of pollination. ✓ Compare the structure of wind pollinated and insect pollinated plants. 	<p>coloured materials on light.</p>	<ul style="list-style-type: none"> oxidation reactions, given the reactants and products. ✓ Predict the products of combustion of fuels. ✓ Give the definition for a decomposition reaction. ✓ Write word equations for decomposition reactions, given the reactants and products. ✓ Using data presented in a table or a bar chart, identify the substance that starts to decompose first. ✓ Show information using ratios. ✓ Simplify ratios in chemical formulae and equations. ✓ Use ratios to calculate values in chemical formulae and equations. ✓ Explain why the total mass of reactants is equal to the total mass of the products in a chemical reaction. ✓ Calculate the mass of one reactant or product in a chemical reaction, given the masses of 	<p>neutralisation reactions.</p> <ul style="list-style-type: none"> ✓ Give examples of useful neutralisation reactions. ✓ Give the definition of a salt. ✓ Predict the salts that form when acids react with metals or bases. ✓ Describe how to make a salt from an acid and a metal or insoluble base. 	<ul style="list-style-type: none"> ✓ Explain why you see lunar and solar eclipses. 	<ul style="list-style-type: none"> ✓ Describe the process of digestion. ✓ Describe the functions of the main structures in the digestive system. ✓ Describe the role of bacteria in digestion. ✓ Give the definition of an enzyme. ✓ Describe the role of enzymes in carbohydrate, protein and lipid digestion. ✓ Give the definition of a drug. ✓ Describe the difference between recreational drugs and medical drugs. ✓ Describe what happens during drug addiction. ✓ Describe some effects of alcohol on the body. ✓ Describe some health problems caused by alcohol consumption. ✓ Describe some effects of alcohol consumption on conception and pregnancy. ✓ Describe the effects of the
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	<ul style="list-style-type: none"> ✓ Describe the process of fertilisation in plants. ✓ Describe how seeds and fruits are formed. ✓ Describe the main steps in germination. ✓ Describe the advantages of seed dispersal. ✓ Explain how seeds are adapted for their method of dispersal. ✓ Describe a method to investigate seed dispersal. 		<p>all other reactants and products.</p> <ul style="list-style-type: none"> ✓ Describe what a balanced formula equation shows. ✓ Describe the energy changes in exothermic and endothermic changes. ✓ Predict whether a given change is exothermic or endothermic. ✓ Identify endothermic and endothermic changes from temperature data. 			<p>components of tobacco smoke on the body.</p> <ul style="list-style-type: none"> ✓ Describe some health problems caused by smoking. ✓ Describe some effects of smoking on pregnancy. ✓
Subject Vocabulary	<p>Tier 2 – Adolescence, emotional, physical, survive, fertilisation, implantation, stimulate, diffuse, infections, specialise, lining, formation, quantity, transfer, adaptation, compete, externa, internal, transport</p> <p>Tier 3 – ovaries, penis, periods, puberty, hormones, testes, bladder, cervix, ovary, oviduct, scrotum, semen, intercourse, sperm duct, urethra, uterus, vagina, cilia, embryo, gamete, fluid sac, placenta,</p>	<p>Tier 2 – Absorb, accuracy, emit, eye, opaque, precisión, ray, reflect, source, transmit, transparent, angle, diffuse, virtual, focus, lens, medium, speed, camera, inverted, iris, pupil, real, absorption, continuous, dispersion, frequency, primary, secondary, spectrum</p> <p>Tier 3 – Light-year, luminous, incidence scattering, diffuse, normal plane, specular, convex, converging, focal point, refraction,</p>	<p>Tier 2 – Energy, reversible, particle, producto, reaction, energy, fuel, fossil, non-renewable, product, decomposition, discrete, element, equation, formula, ratio, conservation, temperature</p> <p>Tier 3 – Catalyst, rusting, reactant, combustion, oxidation, thermal, atom, balanced equation, endothermic, exothermic</p>	<p>Tier 2 – Acid, concentrated, corrosive, dilute, hazard, risk, indicator, neutral, independent, dependent, control, variables, compound</p> <p>Tier 3 – Alkali, litmus, pH, universal indicator, base, salt</p>	<p>Tier 2 – Moon, planet, solar system, star, Sun, Universe, asteroid, astronomical, dwarf planet, terrestrial, axis, constellation, day, night, season, year, phases</p> <p>Tier 3 -satellite, celestial body, comet, meteor, meteorite, Milky Way, ellipse, gas giant, exoplanet, hemisphere, lunar eclipse, solar eclipse, penumbra, umbra</p>	<p>Tier 2 – balanced, diet, carbohydrate, essential, fibre, mineral, nutrient, protein, source, survive, vitamin, irritant, nutrient, solution, starch, sugar, translucent, deficiency, malnourishment, obese, requirements, starvation, digestion, function, stomach, bacteria, bile, addiction, drug, medicinal, recreational, risk, symptom, withdrawal, aggressive, depressant, efficient, premature, inflate,</p>

	<p>gestation, umbilical, ovulation, anther, carpel, filament, nectar, ovule, pollen, pollination, petal, sepal, stamen, stigma, style, germination, photosynthesis, seed</p>	<p>aperture, charge-coupled device (CCD), cornea, photoreceptor, pixel, retina, prism</p>				<p>passive, tobacco, toxic</p> <p>Tier 3 – lipid, Benedict's solution, Biuret, distilled, iodine, adaptation, anus, faeces, gullet, intestine, rectum, villi, carbohydrase, catalyst, enzyme, lipase, protease, ethanol, placenta, unit, alveoli, monoxide, nicotine, tar</p>
Subject Texts Used	<p>Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/how-are-chemicals-impacting-our-reproductive-health/ The Selfish Gene – Richard Dawkins A Short History of nearly everything – Bill Bryson The Body – Bill Bryson</p>	<p>Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/how-can-we-make-sure-to-catch-only-the-fish-we-want-to-eat/ The Body – Bill Bryson</p>	<p>Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/what-difference-do-cleaner-burning-cookstoves-make/ A Short History of nearly everything – Bill Bryson Reactions – Theodore Gray The disappearing spoon – Sam Kean Your atomic self – Curt Stager</p>	<p>Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/how-special-do-you-have-to-be-to-live-in-acidic-soil/ A Short History of nearly everything – Bill Bryson The disappearing spoon – Sam Kean</p>	<p>Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/how-can-dust-make-planets-more-suitable-for-life/ A Short History of nearly everything – Bill Bryson The Planets – Dave Sobel What if? – Randall Munroe</p>	<p>Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/what-makes-you-choose-the-food-you-eat/ https://www.sciencejournalforkids.org/articles/how-does-the-food-you-eat-affect-your-growth-and-development/ Your atomic self – Curt Stager What if? – Randall Munroe A Short History of nearly everything – Bill Bryson The Body – Bill Bryson</p>
Cultural Enrichment Opportunities	<p>Practical work, modelling Bodyworks video clips</p>	<p>Practical work, modelling, MOSI visit, Eureka Halifax visit, STEM ambassadors –</p>	<p>Practical work, modelling, MOSI visit, Eureka Halifax visit, STEM ambassadors</p>	<p>Practical work, modelling, MOSI visit, Eureka Halifax visit, STEM ambassadors</p>	<p>Jodrell Bank – Science trip, National Space centre – Leicester – School trip. Practical</p>	<p>Youtube Body works video clips</p>

	BBC Bitesize Animations Bodyworks Science Trip Stem Ambassadors – Surgeon or Medical Professional virtual speaker	ophthalmist speech/visit, BBC Bitesize animations	BBC Bitesize animations	BBC Bitesize animations	work, modelling, MOSI visit, Eureka Halifax visit, STEM ambassadors BBC Bitesize animations	Healthy schools award – work with catering staff / SLT Stem Ambassadors Visit / virtual Q&A CREST Award Project on Healthy Eating
Learning Behaviours	Safe working - Carrying out practical work, Observation - Tracking Teacher in class, viewing slides using a microscope, Following instructions - When carrying out tasks assigned by your teacher, Purposeful Conversation - When talking with a partner or in a group about learning focus					

Science Y7 Curriculum Time – 6 hours per fortnight (2 Week Timetable)

Year 8 Curriculum #1						
Learning Focus	Periodic table	Electricity and Magnetism	Biological Processes	Separation Techniques	Energy	Ecosystems and adaptation
Learning Hours Associated	Approx. 10 hours Week 1 – Week 3.5	Approx. 12 hours Week 3.5 - Week 7.5	Approx 8 hours Week 7.5 – Week 10	Approx 10 hours Week 10 – 13.5	Approx 11 hours (Week 16 – Week 19)	Approx 8 hours (Week 20 – Week 22)
What pupils will know, understand and be able to do.	<ul style="list-style-type: none"> ✓ To know the meaning of the terms physical and chemical properties. ✓ To know the uses of physical and chemical properties of typical metals and non-metals. ✓ To describe groups and Periods in the periodic table – trends in properties. ✓ To know and explain Group 1 elements – physical properties, trends, reactions with water 	<ul style="list-style-type: none"> ✓ To know what static electricity is. ✓ To be able to build circuits and take measurements. ✓ To know the effects of magnetic fields and their uses. ✓ To identify positive and negative charges. ✓ Be able to define current, p.d. and resistance. ✓ Be able to draw circuit diagrams. ✓ To describe how to use an ammeter and voltmeter. ✓ To describe the difference 	<ul style="list-style-type: none"> ✓ Understand the process of photosynthesis. ✓ To give the word equation for photosynthesis. ✓ Understand how to test a leaf for the presence of starch. ✓ Understand the main adaptations of a leaf. ✓ Understand the role of stomata. ✓ Understand how water is transported through a plant. ✓ Understand how a plant uses minerals for healthy growth. 	<ul style="list-style-type: none"> ✓ Define the word 'pure' in a scientific sense. ✓ Understand how to use a temperature-time graph for a melting substance to determine whether it is pure. ✓ Define a mixture. ✓ Compare mixtures and compounds. ✓ Define solution, solute, solvent and dissolve. ✓ Use the particle model to explain dissolving. ✓ Predict the mass of a solution made from given masses 	<ul style="list-style-type: none"> ✓ Compare the energy values of foods and fuels. ✓ Compare the energy requirements of different activities. ✓ Describe how fossil fuels are formed. ✓ Describe the difference between a renewable and a non-renewable energy source. ✓ Describe how electricity is generated with renewable and non-renewable resources. 	<ul style="list-style-type: none"> ✓ Use relevant information to construct a food chain. ✓ Describe the feeding relationship between organisms in a food chain. ✓ Describe the feeding relationships between organisms within a food web. ✓ Describe what is meant by the interdependence of organisms. ✓ Suggest and justify how the change in a population of one organism

	<ul style="list-style-type: none"> ✓ To know and explain Group 7 elements – states, colours, physical properties, trends in reactivity ✓ To know and explain Group 0 elements – physical properties, trends, suitability for uses 	<ul style="list-style-type: none"> between conductors and insulators. ✓ To be able to change the subject of an equation. ✓ Be able to compare series and parallel circuits. ✓ To describe the magnetic field around a current carrying wire. ✓ To describe how to make an electromagnet and how to change the strength. ✓ To describe some uses of electromagnets. ✓ To describe how a simple motor works. 	<ul style="list-style-type: none"> ✓ Understand the symptoms of plant mineral deficiencies. ✓ Understand why farmers use fertilisers. ✓ Understand the process of aerobic respiration. ✓ To give the word equation for aerobic respiration. ✓ Understand how the reactants and products of photosynthesis are transported to and from cells. ✓ Compare the processes of aerobic and anaerobic respiration. ✓ Give the word equation for anaerobic respiration. ✓ Give the word equation for fermentation. 	<ul style="list-style-type: none"> of solute and solvent. ✓ Define solubility. ✓ Plot a solubility – temperature graph from data in a table. ✓ Understand how solubility changes with temperature for a named substance given data in a table or line graph. ✓ Name the types of mixtures that can be separated by filtration. ✓ Understand how filtration works. ✓ Understand some uses of filtration. ✓ Understand how evaporation occurs – use the particle model to help explain. ✓ Understand how to use distillation to separate mixtures. ✓ Understand how to use chromatography to separate the substances in a mixture. ✓ Analyse chromatograms to identify substances in a mixture. 	<ul style="list-style-type: none"> ✓ Describe the energy stores involved in everyday transfers. ✓ Describe the ways of transferring energy between stores. ✓ Use the law of conservation of energy in energy analysis. ✓ Describe the difference between energy and temperature in terms of particles in a substance. ✓ Describe the factors that affect the change of temperature of a substance. ✓ Explain what is meant by equilibrium in terms of energy and temperature. ✓ Describe how energy is transferred by particles during conduction. ✓ Describe how energy is transferred by particles during convection. ✓ Explain how an insulator can reduce energy transfer, 	<ul style="list-style-type: none"> affects the population of another within a food web. ✓ Describe how toxic materials can accumulate in a food chain. ✓ Define the terms habitat, community and ecosystem. ✓ Describe how different organisms co-exist within an ecosystem. ✓ Explain the resources that plants and animals compete for. ✓ Describe the interaction between predator and prey population. ✓ Describe how organisms are adapted to their environment. ✓ Describe how organisms adapt to environmental changes.
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Subject Vocabulary	<p>Tier 2 - Metal, non-metal, physical, property, group, reactive, unreactive, chemical</p> <p>Tier 3 - acid, period, Halogen, unreactive</p>	<p>Tier 2 - field, terminal, conductor, insulator, pole, core, switch, relay</p> <p>Tier 3 - Electron, ammeter, circuit, potential difference, Voltmeter, Ohms, conductor, insulator, parallel, series, magnetise.</p>	<p>Tier 2 – reaction, consume, convert, digestion, photosynthesis, producer, diffuse, evaporate, deficiency, fertiliser, harvest, proteins, exhale, inhale, fermentation, strenuous, debt</p>	<p>Tier 2 – dissolve, solution, solvent, insoluble, soluble, filter, filtration, residue, distillation,</p> <p>Tier 3 – solute, solubility, filtrate, chromatogram,</p>	<p>Tier 2 –Energy, fuel, Joule, resource, fossil fuel, non-renewable, renewable, dissipated, electromagnetic, conduction, insulator, radiation, lever, machine, work, Watt</p> <p>Tier 3 –Kilojoule, nuclear, thermal, uranium, gravitational,</p>	<p>Tier 2 – Bacteria, carnivore, consumer, decomposer, diagram, nutrients, photosynthesis, predator, prey, producer, transfer, depend, interdependence, pollination, population, co-exist, community, compete, decompose,</p>

			Tier 3 – algae, chlorophyll, chloroplasts, variegated, adaptations, chloroplasts, stomata, amino acids, nitrates, phosphates, glucose, haemoglobin, mitochondria, plasma, anaerobic, ethanol, lactic acid,		kinetic, conservation, potential, equilibrium, convection, current, electromagnetic spectrum, infrared, thermal imaging camera, newtonmeter, kilowatt, kilowatt hour, power	ecosystem, environment, habitat, location, niche, particular, camouflage, hibernation, maximise, migration, seasons, survival Tier 3 – food chain, food web, fungi, herbivore, bioaccumulation, insecticides, microorganism, quadrat, transect, adaptation,
Subject Texts Used	Oxford smart active kerboodle https://www.sciencejournalforkids.org/articles/can-materials-made-of-the-same-elements-have-different-properties/ A Short History of nearly everything – Bill Bryson Magic Furnace – Marcus Chown Reactions – Theodore Gray	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/can-a-robotic-arm-be-controlled-by-the-brain/ A Short History of nearly everything – Bill Bryson Science matters – Robert M Hazen	Oxford smart active kerboodle https://www.sciencejournalforkids.org/articles/how-do-plants-keep-in-touch/ Life Ascending – Nick Lane Origin of Species – Charles Darwin	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/how-can-we-store-carbon-dioxide-from-the-atmosphere-in-minerals/ Science matters – Robert M Hazen	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/waste-to-energy-how-can-we-get-the-most-from-our-waste/ A Short History of Nearly Everything – Bill Bryson What if? – Randall Munroe	Oxford smart active kerboodle https://www.sciencejournalforkids.org/articles/how-do-pesticides-get-into-honey/ A Short History of Nearly Everything – Bill Bryson
Cultural Enrichment Opportunities	History of periodic table – role of Manchester based scientists in identifying structures in the atom.	Electricity generation – discussion/debate concerning greenhouse gases and conserving electricity and fossil fuels. Science and industry museum visit –	Visit to RHS Bridgewater looking at best conditions to grow certain plants YouTube video links and clips Visit to Hopwood College Horticulture Visit a local park to look at how plants are	Link to food lessons – use of mixtures and dyes in cooking.	MOSI visit, Practical work, modelling, BBC Bitesize videos, Science museum – London – cisit/virtual tour/use of videos	Natural history museum London virtual tour Visit / Speaker from National Wetlands Trust (Martin Mere) or a visit for students to look at the natural ecosystem and how animals have

		timeline of electricity use and generation.	adapted for particular conditions – which leaves would contain the most starch? Use of STEM Ambassador program to invite speakers / presenters / roadshow to groups of students.			adapted to living there. Visit to World Museum Liverpool looking at variation in species of butterflies and moths Chester zoo visit or guest speaker with a focus on variation and natural selection The living rainforest school tour (virtual) see link below. MOSI visit, Eureka Halifax visit, STEM ambassadors BBC Bitesize animations
Learning Behaviours	Safe Working - Practical Work in Science Lab Active Listening- Listening to staff and other students to develop knowledge of key concepts Problem Solving - Quizzes, group tasks, comprehension tasks Creative Thinking - Making models, cartoon strips	Safe Working - Practical Work in Science Lab Active Listening- Listening to staff and other students to develop knowledge of key concepts Problem Solving - Quizzes, group tasks, comprehension tasks Creative Thinking - Making models, cartoon strips	Safe Working - Practical Work in Science Lab Active Listening- Listening to staff and other students to develop knowledge of key concepts Problem Solving - Quizzes, group tasks, comprehension tasks Creative Thinking - Making models, cartoon strips	Safe Working - Practical Work in Science Lab Active Listening- Listening to staff and other students to develop knowledge of key concepts Problem Solving - Quizzes, group tasks, comprehension tasks Creative Thinking - Making models, cartoon strips		Practical work, modelling,

Year 8 Curriculum #2

Learning Focus	Metals and other materials	Motion and pressure	The Earth	Inheritance	Forces and motion
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Learning Hours	Approx 11 hours (Week 22 – Week 26)	Approx 9 hours (Week 27 – Week 29)	Approx 11 hours (Week 30– Week 32)	Approx 8 hours (Week 33 – Week 35)	Approx 10 hours (Week 35 – Week 39)
What pupils will know, understand and be able to do.	<ul style="list-style-type: none"> ✓ Predict the products of the reaction of a metal with acid. ✓ Write a word equation for the reaction of a metal with acid. ✓ Predict the products of the reaction of a metal with oxygen. ✓ Write a word equation for the reaction of a metal with oxygen. ✓ Compare the patterns in the reactivity of metals with acids and oxygen. ✓ Predict the products of the reaction of a metal with water. ✓ Write a word equation for the reaction of a metal with water. ✓ Use the reactivity series to predict how vigorously metals react with acids, oxygen and water. ✓ State the meaning of displacement reaction. ✓ Identify pairs of substances that do and do not react in displacement reactions. ✓ Predict the products of displacement reactions. ✓ Describe the steps to extract a metal from its ore. ✓ Name metals that are extracted by heating their ores with carbon. 	<ul style="list-style-type: none"> ✓ Calculate average speed. ✓ Describe the difference between average and instantaneous speed. ✓ Describe examples of relative motion. ✓ Describe motion using a distance-time graph. ✓ Use data from a distance-time graph to calculate average speed. ✓ Describe how volume and temperature affect gas pressure. ✓ Give the definition of atmospheric pressure. ✓ Describe how atmospheric pressure changes with height. ✓ Describe how liquids exert a pressure in all directions. ✓ Describe how liquid pressure changes with depth. ✓ Explain why some everyday objects float and sink. ✓ Give the definition of pressure and give the direction it acts in. ✓ Calculate pressure. ✓ Describe situations where high and low pressures are useful. ✓ Define the moment of a force. 	<ul style="list-style-type: none"> ✓ Compare the layers of the Earth. ✓ Describe the composition of the Earth's atmosphere. ✓ Explain two properties of sedimentary rock. ✓ Describe the four stages in the formation of sedimentary rock. ✓ Explain how the properties of sedimentary rocks make them suitable for their uses. ✓ Describe how igneous and metamorphic rocks form. ✓ Explain the properties of igneous and metamorphic rocks. ✓ Explain how the properties of igneous and metamorphic rocks make them suitable for their uses. ✓ Use the rock cycle to describe how the materials in rocks are recycled. ✓ Explain how uplift provides evidence for the rock cycle. ✓ Explain the relative stability in the concentration of Carbon Dioxide in the atmosphere over part of the Earth's history. 	<ul style="list-style-type: none"> ✓ Give the definition of variation. ✓ Give examples to describe the differences between inherited and environmental variation. ✓ Use examples to describe the difference between continuous and discontinuous variation. ✓ Choose and justify the most appropriate graph to display examples of variation data. ✓ Give the definition of DNA, chromosome and gene. ✓ Describe how characteristics are inherited. ✓ Describe how scientists worked together to develop the DNA model. ✓ Describe the role of the fossil record as evidence for evolution. ✓ Describe the process of natural selection. ✓ Describe how new species evolve through the process of natural selection. ✓ Describe some factors that may lead to extinction. ✓ Describe how gene banks can be used to prevent the extinction of a species. 	<ul style="list-style-type: none"> ✓ Revision and application of Y7 Topic Forces. ✓ Use Newton's third law to explain how forces arise and change motion. ✓ Describe the link between forces and fields and calculate values. ✓ Compare systematic and random errors. ✓ Make estimates about everyday speed and use a distance-time graph to calculate speed. ✓ Explain equilibrium and circular motion in terms of forces. ✓ Describe what is meant by a resultant force. ✓ Describe what is meant by a vector and a scalar. ✓ Calculate resultant forces. ✓ Calculate acceleration and describe motion using a speed-time graph.

	<ul style="list-style-type: none"> ✓ Calculate the mass of metal in an ore. ✓ Describe the properties of ceramics. ✓ Explain why the properties of ceramics make them suitable for their uses. ✓ Explain how polymer properties make them suitable for their uses. ✓ Explain the properties of some composites. ✓ Explain why the properties of composites make them suitable for their uses. 	<ul style="list-style-type: none"> ✓ Calculate the moment of a force. ✓ Apply the law of moments. 	<ul style="list-style-type: none"> ✓ Describe the processes by which Carbon atoms move from one store to another. ✓ Describe what the greenhouse effect is. ✓ Give the definition of global heating. ✓ Describe how the concentration of Carbon Dioxide in the atmosphere has changed. ✓ Explain why global heating happens. ✓ Describe some impacts of global heating. ✓ Describe how to prevent climate change. ✓ Give the definition of recycling. ✓ Describe how aluminium is recycled. ✓ Describe some advantages and disadvantages of recycling. 		
Subject Vocabulary	<p>Tier 2 – Acid, alkali, unreactive, displace, displacement, properties, polymer, carbon fibre,</p> <p>Tier 3 – reactivity, ore, ceramic, natural polymer, synthetic polymer, composite</p>	<p>Tier 2 – average speed, relative motion, distance-time graph, atmospheric pressure, compressed, pressure, density, incompressible, upthrust, centre of gravity, centre of mass, pivot,</p> <p>Tier 3 – instantaneous speed, metres per second, newtons per metre,</p>	<p>Tier 2 – Atmosphere, crust, mantle, ore, compaction, deposition, erosion, porus, sediment, weathering, lava, magma, uplift, combustion, photosynthesis, respiration, global warming, greenhouse effect, climate change, deforestation</p> <p>Tier 3 – inner core, outer core, troposphere, cementation, sedimentary,</p>	<p>Tier 2 – Characteristic, difference, identical, value, helix, inherit, model, bacteria, camouflage, evolution, gradually, successful, biodiversity, endangered, extinct, research</p> <p>Tier 3 – environmental, variation, inherited, organism, species, continuous, discontinuous,</p>	<p>Tier 2 – interaction, magnitude, average, gradient, inertia, mass, weight, accelerate, estimate, tangent, displacement</p> <p>Tier 3 – contact force, interaction pair, Newton's third law, non-contact force, upthrust, directly proportional, graduation, gravitational field, random</p>

		squared, pascal, law of moments, newtonmetres,	igneous, metamorphic, rock cycle, carbon cycle, carbon store, global heating	chromosome, DNA, egg cell, gene, nucleus, sperm, adaptation, fossil, natural selection, species, unicellular, gene bank,	error, systematic error, distance-time graph, equilibrium, centripetal force, terminal velocity, velocity, resultant force, vector
Subject Texts Used	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/what-can-termites-teach-us-about-better-building-materials/ Science matters – Robert M Hazen The disappearing spoon – Sam Kean	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/can-we-use-bacteria-to-make-renewable-rocket-fuel/ What if? – Randall Munroe A Short History of nearly everything – Bill Bryson	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/how-could-baby-dinosaurs-live-in-the-arctic/ https://www.sciencejournalforkids.org/articles/what-is-going-on-in-the-tropical-stratosphere/ The planets – Dava Sobel What if? – Randall Munroe A Short History of nearly everything – Bill Bryson	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/what-can-fossils-tell-us-about-the-nervous-systems-evolution/ https://www.sciencejournalforkids.org/articles/what-can-tusks-tell-us-about-the-lives-of-mastodons/ Life Ascending – Nick Lane The Vital Question – Nick Lane Only the longest threads – Tasneem Zehra Husain What if? – Randall Munroe A Short History of nearly everything – Bill Bryson Origin of species – Charles Darwin The Body – Bill Bryson	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/how-can-we-simulate-a-lab-on-a-chip/ What if? – Randall Munroe A Short History of nearly everything – Bill Bryson Science Matters – Robert M Hazen
Cultural Enrichment Opportunities	Catalyst museum – Widnes – Science trip, Practical work, modelling, BBC Bitesize videos, Xplore Science museum visit - Wrexham	Practical work, modelling, MOSI visit, Eureka Halifax visit, STEM ambassadors BBC Bitesize animations	Practical work, modelling, MOSI visit, Eureka Halifax visit, STEM ambassadors BBC Bitesize animations	Visit to RHS Bridgewater looking at inheritance and inherited characteristics in plants Chester zoo workshops looking at inheritance (40 min session) Evolution (40 min session) YouTube video links and clips Use of STEM Ambassador program to invite speakers /	Practical work, modelling, MOSI visit, Eureka Halifax visit, STEM ambassadors BBC Bitesize animations

				<p>presenters / roadshow to groups of students.</p> <p>Palaeoquest workshop – see link (implementation guide)</p> <p>The living rainforest – see link (implementation guide)</p>	
Learning Behaviours	<p>We use appropriate language and communication.</p> <p>We do not use personal electronic devices during the school day.</p> <p>Safe Working - Practical Work in Science Lab, Active Listening - Listening to staff and other students to develop knowledge of key concepts, Problem Solving - Quizzes, group tasks, comprehension tasks, Creative Thinking - Making models, cartoon strips,</p>	<p>We use appropriate language and communication.</p> <p>We do not use personal electronic devices during the school day.</p> <p>Safe Working - Practical Work in Science Lab, Active Listening - Listening to staff and other students to develop knowledge of key concepts, Problem Solving - Quizzes, group tasks, comprehension tasks, Creative Thinking - Making models, cartoon strips,</p>	<p>We use appropriate language and communication.</p> <p>We do not use personal electronic devices during the school day.</p> <p>Safe Working - Practical Work in Science Lab, Active Listening - Listening to staff and other students to develop knowledge of key concepts, Problem Solving - Quizzes, group tasks, comprehension tasks, Creative Thinking - Making models, cartoon strips,</p>	<p>We use appropriate language and communication.</p> <p>We do not use personal electronic devices during the school day.</p> <p>Safe Working - Practical Work in Science Lab, Active Listening - Listening to staff and other students to develop knowledge of key concepts, Problem Solving - Quizzes, group tasks, comprehension tasks, Creative Thinking - Making models, cartoon strips,</p>	<p>We use appropriate language and communication.</p> <p>We do not use personal electronic devices during the school day.</p> <p>Safe Working - Practical Work in Science Lab, Active Listening - Listening to staff and other students to develop knowledge of key concepts, Problem Solving - Quizzes, group tasks, comprehension tasks, Creative Thinking - Making models, cartoon strips,</p>

Science Y8 Curriculum Time – 6 hours per fortnight (2 Week Timetable)

Year 9 Curriculum #1						
Learning Focus	Cells 2	Particle model	Energy	Cell Systems	Atoms and periodic table	Waves, sound and light
Learning Hours Associated	Approx 10 hours (Week 1 – Week 3.5)	Approx 10 hours (Week 3.5 – Week 7)	Approx 11 hours (Week 7 – Week 10.5)	Approx 10 hours (Week 10.5 – Week 14)	Approx 11 hours (Week 16 – Week 19)	Approx 11 hours (Week 20 – Week 23)
What pupils will know, understand	✓ To compare plant and animal cells.	✓ Revision and application of Y7	✓ Revision and application of Y8 Energy topic.	✓ Revision of Y7 Structure and function of body	✓ Revision and application of Y7 Elements atoms	✓ Revision and application of Y7

<p>and be able to do.</p>	<ul style="list-style-type: none"> ✓ To give examples of specialised cells and how they are specialised. ✓ To explain how xylem and phloem and adapted to their function. ✓ To define aerobic respiration. ✓ To define and explain diffusion. ✓ To describe the difference between diffusion and active transport ✓ To define and explain osmosis. 	<p>Particles and Behaviour topic</p> <ul style="list-style-type: none"> ✓ Explain how Brownian motion and dilution give evidence for the particle model. ✓ Explain how a scientific theory changed over time. ✓ Explain why something is, or is not, a substance. ✓ Describe the movement, arrangement and separation of the particles in foams and aerosols. ✓ Use the particle model to explain applications of sublimation. ✓ Use the 18erboodl model to explain energy changes in changes of state. ✓ Evaluate the strengths and weaknesses of the particle model. 	<ul style="list-style-type: none"> ✓ Analyse situations in terms of energy stores. ✓ Understand how ideas about energy have changed. ✓ Analyse situations in terms of energy transfers. ✓ Understand different rates of thermal energy transfer and how to investigate them. ✓ Understand electricity generation. ✓ Understand the effect of using electrical devices on energy resources. ✓ To use energy conservation and dissipation in energy analyses. ✓ Understand methods to reduce dissipation. ✓ Calculate work and power of machines. ✓ Understand what is meant by efficient and calculate efficiency. 	<p>systems topic and Y8 Biological processes topic.</p> <ul style="list-style-type: none"> ✓ To use the circulatory system to explain the hierarchy of organisation in a multicellular system. ✓ To interpret information on the commercial use of digestive enzymes. ✓ Understand how alveoli are adapted for gas exchange. ✓ Understand how the structure of a leaf is adapted for photosynthesis. ✓ Understand the structure and function of the circulatory system. ✓ Understand the transpiration stream. 	<p>and compiunds topic, and Y8 Periodic table topic.</p> <ul style="list-style-type: none"> ✓ Describe the structure of an atom. ✓ Describe the contributions of different scientists to the discovery of the periodic table. ✓ Classify an element as a metal on non-metal given its properties. ✓ Describe patterns in the properties of the group 2 elements. ✓ Explain how the uses of elements, compounds and mixtures depend on their properties. ✓ Draw electronic structure for atoms. ✓ Define covalent and ionic bonding. ✓ Use ratios to determine chemical formula. 	<p>topics Light and Sound.</p> <ul style="list-style-type: none"> ✓ Compare properties of waves, including those of seismic waves. ✓ Describe how waves are used to investigate structures that cannot be observed. ✓ Use ray diagrams to explain illusions caused by reflection and refraction. ✓ Use reflection and refraction to explain how telescopes and curved mirrors work. ✓ Describe how ideas about light have changed. ✓ Explain the link between the colours of the spectrum, primary and secondary colours.
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			<ul style="list-style-type: none"> ✓ Understand what elastic energy depends on. ✓ To calculate elastic energy using an equation or a graph. 			
Subject Vocabulary	<p>Tier 2 – Membrane, flaccid, permeable, gradient, concentration,</p> <p>Tier 3 – mitochondria, vacuole, cytoplasm, chloroplast, phloem, xylem, alveoli, haemoglobin, partially permeable, active transport</p>	<p>Tier 2 - substance, conclusion, data,</p> <p>Tier 3 – Aerosol, Brownian, exothermic, endothermic, sublimation, boiling, condense, deposition,</p>	<p>Tier 2 – heating, conduction, range, resource, non-renewable, insulation, efficiency, deform, extension</p> <p>Tier 3 – thermal equilibrium, gravitational potential, kinetic, infrared, conductivity, dissipation, conservation, elastic limit, limit of proportionality, spring constant,</p>	<p>Tier 2 – cell, digestion, specialised, transfer, organisation, carbohydrate, cross-section, evaporate</p> <p>Tier 3 – diffusion, enzyme, photosynthesis, villi, circulatory, tissue, amino acid, catalyst, fatty acid, glycerol, lipase, lipid, protease, alveoli, concentration gradient diffusion, exchance surface, chlorophyll, epidermis, palisade, mesophyll, phloem, stomata, xylem, artery, capillary, cardiac, lumen, vein, ventricle</p>	<p>Tier 2 –compound, configuration, element, formulation, mixture, analogy, chemical property, metal, physical property, non-metal, group, hardness, period, particle,</p> <p>Tier 3 – atom, atomic number, covalent, electron, ionic, mass number, neutron, proton, nucleus, sub-atomic particle, electronic structure, shell,</p>	<p>Tier 2 – compression, frequency, snapshot, magnify, lens, objective, pixel, primary colour, secondary colour, spectrum, mutation, aerial, radioactive, signal</p> <p>Tier 3 – amplitude, longitudinal, transverse, rarefaction, ray, refraction, wavefront, wavelength, P-wave, period, S-wave, seismic, mechanical, seismograph, sesiometer, transducer, ultrasound, conve, focus, image, ray diagram, spectral frequency, ionisation, radiation, carrier wave, radiotherapy, radiotherapy, signal,</p>
Subject Texts Used	Oxford smart active kerboodle, Origin of Species – Charles Darwin	Oxford smart active kerboodle, Magic Furnace – Marcus Chown	Oxford smart active kerboodle https://www.sciencejournalforkids.org/articles/how-can-we-store-carbon-dioxide-from-	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/how-can-we-reduce-our-	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/can-materials-made-of-the-same-	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/

	The Immortal life of Henrietta Lacks – Rebecca Skloot https://www.sciencejournalforkids.org/article/s/how-do-bacteria-help-plants/	https://www.sciencejournalforkids.org/article/s/how-can-the-eruption-of-a-volcano-affect-the-ocean-everywhere-on-earth/	the-atmosphere-in-minerals/ Science matters – Robert M Hazel	environmental-footprint-one-food-at-a-time/ The Body – Bill Bryson Your atomic self – Curt Stager	elements-have-different-properties/ A Short History of Nearly Everything – Bill Bryson Science matters – Robert M Hazen The disappearing spoon – Sam Kean Magic Furnace – Marcus Chown Reactions – Theodore Gray	es/did-atmospheric-waves-get-wavier/ A Short History of Nearly Everything – Bill Bryson Science matters – Robert M Hazen What if? – Randall Munroe
Cultural Enrichment Opportunities	Body works video clips Children's science Christmas lectures Eureka Wallesey Trip Stem Ambassadors Visit / virtual Q&A	History of Science – observations and data presentation regarding Brownian motion	Environmental issues – conservation of fossil fuels, greenhouse effect of burning fuels and increased use of renewable resources and how this affects the Earth and environment.	Youtube – see useful links Body works video clips Eureka Wallesey Science Museum London MOSI Manchester	Practical work, modelling, BBC Bitesize Animations , Stem Ambassadors	Practical work, modelling, BBC Bitesize Animations , Stem Ambassadors
Learning Behaviours	Safe working - Carrying out practical work, Observation - Tracking Teacher in class, viewing slides using a microscope, Following instructions - When carrying out tasks assigned by your teacher, Purposeful Conversation - When talking with a partner or in a group about learning focus	Safe working - Carrying out practical work, Observation - Tracking Teacher in class, viewing slides using a microscope, Following instructions - When carrying out tasks assigned by your teacher, Purposeful Conversation - When talking with a partner or in a group about learning focus	Safe working - Carrying out practical work, Observation - Tracking Teacher in class, viewing slides using a microscope, Following instructions - When carrying out tasks assigned by your teacher, Purposeful Conversation - When talking with a partner or in a group about learning focus	Safe working - Carrying out practical work, Observation - Tracking Teacher in class, viewing slides using a microscope, Following instructions - When carrying out tasks assigned by your teacher, Purposeful Conversation - When talking with a partner or in a group about learning focus	Safe working - Carrying out practical work, Observation - Tracking Teacher in class, viewing slides using a microscope, Following instructions - When carrying out tasks assigned by your teacher, Purposeful Conversation - When talking with a partner or in a group about learning focus	Safe working - Carrying out practical work, Observation - Tracking Teacher in class, viewing slides using a microscope, Following instructions - When carrying out tasks assigned by your teacher, Purposeful Conversation - When talking with a partner or in a group about learning focus

Year 9 Curriculum #2

Learning Focus	Fertilisation and Implantation	Chemical changes	Electricity and magnetism	Variation and natural selection	Useful chemical reactions
Learning Hours Associated	Approx 8 hours (Week 23 – Week 26)	Approx 10 hours (Week 27 – Week 29.5)	Approx 10 hours (Week 29.5 – Week 32)	Approx 8 hours (Week 32 – Week 35)	Approx 11 hours (Week 35 – Week 39)
What pupils will know, understand and be able to do.	<ul style="list-style-type: none"> ✓ Revision and application of Y7 reproduction topic and Y8 Inheritance topic. ✓ Compare the process of sexual reproduction in plants and animals. ✓ Evaluate the use of some different methods of contraception. ✓ Interpret diagrams showing the main stages in the menstrual cycle. ✓ Explain the steps taken to produce valid data in a seed dispersal investigation. ✓ Describe the difference between dominant and recessive alleles. ✓ Describe how clones are produced through the process of asexual reproduction. 	<ul style="list-style-type: none"> ✓ Revision and application of Y7 reactions topic. ✓ Compare particle changes in physical and chemical changes. ✓ Predict the products of combustion reactions. ✓ Interpret and write balanced symbol equations. ✓ Apply the idea of conservation of mass. ✓ Compare energy changes in combustion reactions. ✓ Interpret observations and data to see if a reaction is endothermic or exothermic. ✓ 	<ul style="list-style-type: none"> ✓ Revision and application of Y8 Electricity and magnetism topic. ✓ Explain why sparks happen. ✓ Describe how static electricity can cause problems and how it can be useful. ✓ Explain the difference between current, potential difference and resistance using models and ideas about fields. ✓ Describe some uses of series and parallel circuits and how you can use them to sense the environment. ✓ Use the domain theory of magnetism to explain permanent and induced magnetism. 	<ul style="list-style-type: none"> ✓ Revision and application of Y8 topic ecosystems and adaptation and Inheritance topic. ✓ Explain why many characteristics are affected both by the environment and through inheritance. ✓ Describe some structural, behavioural and functional adaptations of animals. ✓ Describe how to investigate the distribution of plants using a transect. ✓ Explain how antibiotic-resistant bacteria evolve as a result of natural selection. ✓ Describe some techniques for maintaining biodiversity. ✓ Use examples to describe the difference between biotic and abiotic factors. 	<ul style="list-style-type: none"> ✓ Revision and application of Y8 Topic metals and other materials. ✓ Explain how metal properties make them suitable for their uses. ✓ Determine the position of a metal in the reactivity series. ✓ Predict whether or not pairs of substances react in displacement reactions. ✓ Explain why different methods are used to extract different metals from their ores. ✓ Explain how catalytic converters make exhaust products less harmful. ✓ Calculate relative masses of molecular elements and compounds. ✓ Calculate percentage yields.
Subject Vocabulary	<p>Tier 2 – characteristic, cycle, inheritance, pollen, variation, clone, gene pool, unethical</p> <p>Tier 3 – anther carpel, chromosome, DNA,</p>	<p>Tier 2 – combustion, product, reaction, carbon neutral, product, balanced, ratio, energy, neutralisation, observation, solution</p>	<p>Tier 2 – cell, charge, earthing, lightning, spark, magnetise, domain demagnetise, AC, DC, National Grid</p>	<p>Tier 2 – characteristic, competition, evolution, extinct, species, variation, camouflage, insulation, resources, sampling, sterile, advantage, biodiversity,</p>	<p>Tier 2 – chemical, displace, physical, property, reactive, hardness, hazard, catalyst</p> <p>Tier 3 – malleable, ductile, electrolysis, transition</p>

	fertilisation, filament, gene, menstrual cycle, ovary, oviduct, ovulation, ovule, penis, pollination, stamen, stigma, style, testis, uterus, vagina, leutinising hormone, oestrogen, allele, dominant, recessive, asexual, cutting	Tier 3 – atpm, endothermic, exothermic, reactant, chemical reaction, physical change, biofuel, hydrocarbon, glucose	Tier 3 – ammeter, current, parallel, potential difference, series, voltmeter, ion, electric field, light-dependent resistor (LDR), variable resistor, indice, permanent, electromagnetic induction, alternating, direct, transformer	conservation, disadvantage, ecosystem, predator Tier 3 – adaptation, fossil, natural selection, environmental, inherited, behavioural, functional, structural, quadrat, transect, antibiotic, antiseptic, disinfectant, mutation, breeding, seed bank, abiotic factor, bioic factor	metal, reacting mass, relative mass, actual yield, percentage yield, theoretical yield
Subject Texts Used	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/why-do-some-clownfish-not-breed/ A Short History of Nearly Everything – Bill Bryson Science matters – Robert M Hazen The Selfish Gene – Richard Dawkins Life Ascending – Nick Lane	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/a-burning-question-how-much-will-climate-change-cost/ What if? – Randall Munroe A Short History of nearly everything – Bill Bryson Science Matters – Robert M Hazen Reactions – Theodore Gray	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/will-artificial-trees-be-the-next-power-plants/ What if? – Randall Munroe A Short History of nearly everything – Bill Bryson Science Matters – Robert M Hazen	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/evolution-in-action-are-voles-shrinking/ Life Ascending – Nick Lane The Vital Question – Nick Lane Only the longest threads – Tasneem Zehra Husain What if? – Randall Munroe A Short History of nearly everything – Bill Bryson Origin of species – Charles Darwin The Body – Bill Bryson	Oxford smart active kerboodle, https://www.sciencejournalforkids.org/articles/heavy-metal-pollution-how-can-we-make-water-safe-to-drink/ What if? – Randall Munroe A Short History of nearly everything – Bill Bryson Science Matters – Robert M Hazen Reactions – Theodore Gray
Cultural Enrichment Opportunities	Practical work, modelling Bodyworks video clips BBC Bitesize Animations Bodyworks Science Trip Stem Ambassadors – Surgeon or Medical Professional virtual speaker	Practical work, modelling, MOSI visit, Eureka Halifax visit, STEM ambassadors BBC Bitesize animations	Practical work, modelling, MOSI visit, Eureka Halifax visit, STEM ambassadors BBC Bitesize animations	Visit to Formby beach to look at sampling of plant distribution along a transect line. Natural history museum London virtual tour Visit to World Museum Liverpool looking at variation in species of butterflies and moths	Practical work, modelling, MOSI visit, Eureka Halifax visit, STEM ambassadors BBC Bitesize animations

				Chester zoo visit or guest speaker with a focus on variation and natural selection	
Learning Behaviours	Safe Working - Practical Work in Science Lab, Active Listening - Listening to staff and other students to develop knowledge of key concepts, Problem Solving - Quizzes, group tasks, comprehension tasks, Creative Thinking - Making models, cartoon strips, Empathy - Miscarriage / termination / pregnancy loss	Safe working - Carrying out practical work, Observation - Tracking Teacher in class, viewing slides using a microscope, Following instructions - When carrying out tasks assigned by your teacher, Purposeful Conversation - When talking with a partner or in a group about learning focus	Safe working - Carrying out practical work, Observation - Tracking Teacher in class, viewing slides using a microscope, Following instructions - When carrying out tasks assigned by your teacher, Purposeful Conversation - When talking with a partner or in a group about learning focus	Safe working - Carrying out practical work, Observation - Tracking Teacher in class, viewing slides using a microscope, Following instructions - When carrying out tasks assigned by your teacher, Purposeful Conversation - When talking with a partner or in a group about learning focus	Safe working - Carrying out practical work, Observation - Tracking Teacher in class, viewing slides using a microscope, Following instructions - When carrying out tasks assigned by your teacher, Purposeful Conversation - When talking with a partner or in a group about learning focus

For Information:

Autumn Term – 15 Weeks (Week 1 – 15)

Spring Term – 11 Weeks (Week 16 – 26)

Summer Term – 13 Weeks (Week 27-39)

Science Y9 Curriculum Time – 6 hours per fortnight (2 Week Timetable)