



Science Learning Map



Biology



Chemistry



Physics

Year	Autumn	Spring	Summer
Nursery	<p>Discuss and investigate the seasonal changes Investigate and discuss celebrations Autumn and weather changes. Describe the differences in the seasons. Discuss how animals are nocturnal linked to Owl Babies. Recognise the changes in the environment during winter. Explore ice melting</p>	<p>Understand that we grow and change from babies. Butterfly Life Cycle Caterpillar to butterfly kit. How keeping healthy affects our bodies. Focus on different textures and materials when building house and bridge linked to stories Look at the natural world and growth of plants, trees and animals linked to Spring How plants change growing sunflowers Which material is best to use to build a house? Understand what plants need to grow and change.</p>	<p>Discuss the different habitats of animals i.e. land and sea. Understand how animals are different i.e. colour and pattern. Caring for animals in the environment What do animals need to survive?</p>
Reception		<p>Selects resources they need to investigate the environment independently. Confident to speak to share their own opinions about plants they have observed. Children work as part of a group to look after plants. Understanding healthy and non-healthy foods. Through a number a week 17-20 we will explore length and size. Making comparisons between the height of our plants and capacity of how much water our plants need. Growing and changes linked to plants and humans. Making comparisons between different plants and how plants have grown. Being aware of what plants need to grow.</p>	<p>Discussing belonging to our families and animals belonging to different animal groups Making good food choices and eating a wide variety of foods. Babies of people and animals– growth and change.</p>
Year 1	<p>Everyday Materials</p> <ul style="list-style-type: none"> Distinguish between an object and the material from which it is made Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock Describe the simple physical properties of a variety of everyday materials <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p>Plants</p> <ul style="list-style-type: none"> Identify and describe the basic structure of a variety of common flowering plants, including trees Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees <p>Seasonal changes</p> <ul style="list-style-type: none"> Observe changes across the 4 seasons Observe and describe weather associated with the seasons and how day length varies. 	<p>Animals including humans</p> <ul style="list-style-type: none"> Identify and name a variety of common animals including, fish, amphibians, reptiles, birds and mammals Identify and name a variety of common animals that are carnivores, herbivores and omnivores describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
Year 2	<p>Everyday Materials</p> <ul style="list-style-type: none"> Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for different uses Compare how things move on different surfaces. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching <p>Animals including humans</p> <ul style="list-style-type: none"> Notice that animals, including humans, have offspring which grow into adults Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>Plants</p> <ul style="list-style-type: none"> Observe and describe how seeds and bulbs grow into mature plants Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. <p>Living things and their habitats</p> <ul style="list-style-type: none"> Explore and compare the differences between things that are living, dead, and things that have never been alive Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. 	<p>Living things and their habitats</p> <ul style="list-style-type: none"> Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other Identify and name a variety of plants and animals in their habitats, including microhabitats
Year 3	Rocks	Animals including Humans	Light

	<ul style="list-style-type: none"> Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties Describe in simple terms how fossils are formed when things that have lived are trapped within rock Recognise that soils are made from rocks and organic matter. <p>Animals including Humans Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat</p>	<ul style="list-style-type: none"> Identify that humans and some other animals have skeletons and muscles for support, protection and movement. <p>Plants</p> <ul style="list-style-type: none"> Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Investigate the way in which water is transported within plants. <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	<ul style="list-style-type: none"> Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by a solid object. Find patterns in the way that the size of shadows change. <p>Forces and Magnets</p> <ul style="list-style-type: none"> Compare how things move on different surfaces. Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having 2 poles. <p>Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.</p>
Year 4	<p>Sound</p> <ul style="list-style-type: none"> Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases. <p>Electricity</p> <ul style="list-style-type: none"> Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>	<p>All Living things</p> <ul style="list-style-type: none"> Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things. <p>States of Matter</p> <ul style="list-style-type: none"> Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature..</p>	<p>Animals including humans</p> <ul style="list-style-type: none"> Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p>
Year 5	<p>Properties and Changes of Materials</p> <ul style="list-style-type: none"> Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution . Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p>	<p>Earth and Space</p> <ul style="list-style-type: none"> Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. Describe the movement of the Moon relative to the Earth. Describe the Sun, Earth and Moon as approximately spherical bodies. Use the idea of the Earth's rotation to explain day and night, and the apparent movement of the sun across the sky. <p>Living things and their habitats</p> <ul style="list-style-type: none"> Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals. <p>Animals including humans Describe the changes as humans develop to old age.</p>	<p>Forces</p> <ul style="list-style-type: none"> Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. <p>Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.</p>
Year 6	<p>Animals including humans</p> <ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. 	<p>Electricity</p> <ul style="list-style-type: none"> Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. 	<p>Evolution</p> <ul style="list-style-type: none"> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

	<ul style="list-style-type: none"> Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans. <p>Light</p> <ul style="list-style-type: none"> Recognise that light appears to travel in straight lines. use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>	<ul style="list-style-type: none"> Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Use recognised symbols when representing a simple circuit in a diagram. <p>Living things and their habitats</p> <p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.</p>	<ul style="list-style-type: none"> Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>
<p>Year 7 (7 lessons over two weeks)</p>	<ol style="list-style-type: none"> Safety in Science – Equipment and hazards. Chemical Changes (pt.1) – Types of reaction, word equations, metal reactions with acids, water and oxygen. Cell Biology – Animal and plant cells, specialised cells, unicellular organisms. Energy (pt.1) – Conduction, convection and radiation, insulation, renewable and non-renewable resources. Assessment 1 Energy Changes – endothermic and exothermic reactions. Chemical Analysis – Mixtures, solutions and solubility, evaporation, distillation, chromatography. <p>Space – The solar system, night and day, seasons, phases of the moon.</p>	<ol style="list-style-type: none"> Infection and response – Microorganisms, diseases, defence against disease. Particle model of matter – The particle model, changes of state, melting and boiling points, diffusion, pressure. Atomic structure & The Periodic Table – Metals and non-metals, The periodic Table, elements, compounds and formulae, Group 1, 7 and 0 elements. Mid-year assessment Organisation (pt.1) – The skeleton, joints, muscles, the respiratory system, smoking, drugs and alcohol, plant reproduction. <p>Waves (pt.1) – Types of wave, sound, loudness and pitch, The Electromagnetic Spectrum, echoes and ultrasound.</p>	<ol style="list-style-type: none"> Assessment 2 Organic Chemistry – Formation of crude oil, basic alkanes and alkenes. Ecology – Food chains and webs, ecosystems and interdependence, predator/prey cycles, adaptation, evolution, competition and extinction, biodiversity. Atomic Structure – The structure of an atom, comparing models of the atom, basic types of radiation, research project on Chernobyl. Forces (pt.1) – Force diagrams, calculating weight, contact & non-contact forces, drag forces and friction, balanced & unbalanced forces. <p>Investigation skills – graphs, method writing, variables, calculating averages, anomalous results, conclusions, evaluations.</p>
<p>Year 8 (7 lessons over two weeks)</p>	<ol style="list-style-type: none"> Homeostasis & Response – Adolescence, reproductive systems, The Menstrual Cycle, Fertilisation & implantation, development of a foetus, contraception. Chemical changes (pt.2) – Acids & alkalis, the pH scale, making indicators, making salts, neutralisation. Energy (pt.2) – Calculating energy & power, cost of electricity and energy bills, energy in foods, energy stores & transfers, calculating kinetic energy and gravitational potential energy. Chemistry of the atmosphere – The atmosphere, the structure of the Earth, the rock cycle. Assessment 1 Organisation (pt.2) – cells, tissues, organs and organ systems, nutrients & a balanced diet, food tests, the digestive system, enzymes & bacteria. <p>Electricity – Static electricity, circuit symbols & drawing circuit diagrams, measuring potential difference and current, introduction to electricity formulae and rearranging formulae.</p>	<ol style="list-style-type: none"> Electricity – Resistance & calculating resistance, basic calculations. Structure & properties – Properties of ionic and simple covalent substances, properties of giant covalent substances, applications of graphene. Quantitative Chemistry – Formulae, calculating relative formula mass, calculating percentage composition. Bioenergetics – Review plants cells and leaf structure, plant minerals and fertilisers, photosynthesis, limiting factors for photosynthesis, plant adaptations, aerobic respiration, anaerobic respiration. Mid-year Assessment Magnetism – Magnets and magnetic fields, electromagnets and building electromagnets, investigating electromagnets. Rate of Reaction – Basic collision theory, methods to measure rate of a reaction, investigating how concentration impact rate of reaction, catalysts. <p>Waves (pt.2) – Types of wave, reflection, refraction, calculating speed of waves, coloured & filters, the eye.</p>	<ol style="list-style-type: none"> Assessment 2 Inheritance, variation & evolution – The structure of DNA, extracting DNA, inheritance, basic genetic diagrams, cell division, genetic modification & ethics, variation. Using Resources – Extracting metals, reduction, displacement, basic electrolysis. Forces (pt.2) – Calculating speed, motion graphs, acceleration & relative motion, calculating work done. <p>Investigation skills – graphs, method writing, variables, calculating averages, anomalous results, conclusions, evaluations.</p>
<p>Year 9 will follow a new order of study agreed on by all secondary school within the MAT follow a new order of study agreed on by all secondary school within the MAT</p>			
<p>Year 9 (Trilogy) (9 lessons over two weeks)</p>	<ol style="list-style-type: none"> Cell Biology (pt.1) – Animal and plant cells, Eukaryotes and prokaryotes, comparing cells, required practical for microscopy, specialised cells, chromosomes, gene and DNA, mitosis and binary fission, meristems. Atomic Structure and The Periodic Table (pt.1) – Elements, compounds and formulae, word and chemical equations, filtration, evaporation and distillation, structure of an atom and electronic configuration, comparing models of the atom, the development of the periodic table, the modern periodic table, group 1, group 7, group 0. Energy (pt.1) – Energy stores and systems, energy transfers, kinetic energy, gravitational potential energy, elastic energy, Hooke's Law, specific heat capacity. Organisation (pt.1) – Cell organisation, the digestive system, nutrients, required practical for food tests, enzymes. Structure, bonding and the properties of matter (pt.1) – ionic bonding, covalent bonding, properties of ionic compounds. Assessment 1 Electricity(pt.1) – Circuit symbols and building basic circuits, measuring current and potential difference in series and parallel circuits, calculating charge and current, resistance and Ohm's Law, required practical for resistance of a wire. 	<ol style="list-style-type: none"> Structure, bonding and the properties of matter (pt.2) – properties of simple covalent substances, polymers, giant covalent structures, fullerenes, metals and metallic bonding, alloys, states of matter and changes of state. Particle model of matter (pt.1) – Calculating density, required practical for density of regular and irregular objects. Atomic structure (pt.1) – Comparing models of the atom, Rutherford's scattering experiment, radioactive decay, isotopes, nuclear equations. Infection and Response (pt.1) – Pathogens, communicable diseases, symptoms, treatments, prevention, fighting disease, white blood cells, vaccination, immunity. Bioenergetics (pt.1) – Plant cells and leaf structure, photosynthesis and starch test, limiting factors, required practical for photosynthesis and light intensity. Quantitative Chemistry – Conservation of mass, relative formula mass, percentage composition, mole calculations, reacting masses, titrations, calculating concentrations. Energy(pt.2) - transfers, systems, efficiency, calculating power, energy resources and their uses, trends in energy resources. <p>Cell Biology (pt.2) – Stems cells, diffusion, osmosis, perfect exchange surfaces.</p>	<ol style="list-style-type: none"> Assessment 2 Cell Biology (pt.3) – Perfect exchange surfaces, required practical for osmosis, active transport. Chemical Changes (pt.1) – The pH scale, acids, bases and alkalis, Neutralisation, acids and carbonates, required practical for acids and metal oxides, reactions between acids and metals, reactions between metals and water, displacement, reduction, electrolysis. Electricity (pt.2) – Resistance in series, thermistors, LDR's, I/V characteristics, AC/DC mains electricity, calculating power, energy transfers in everyday appliances, $I=Q/t$, $E=QV$, The National Grid. Energy Changes – Endothermic and exothermic reactions, reaction profiles, required practical for energy changes, bond energy calculations. Organisation (pt.3) – Communicable and non-communicable diseases, risk factors, coronary heart disease, artificial blood, artificial hearts, artificial valves, cancer. Infection and Response (pt.2) – fighting disease, vaccination, developing drugs, drug trials, antibiotic resistance. <p>Investigation skills – Method writing, results tables, collecting results, drawing graphs, maths skills, averages, standard form, conclusions, evaluations etc.</p>

	Organisation (pt.2) – Required practical for enzymes, the circulatory system, the heart, blood composition, the lungs and gas exchange.		
Year 9 (Biology) (3 lessons over two weeks)	<ol style="list-style-type: none"> Cell biology (pt.1) – Plant and animal cells, using microscopes and microscopy, calculating magnification, specialised cells, prokaryotic and eukaryotic cells, comparing light and electron microscopes, Chromosomes and DNA, mitosis and binary fission, stem cells and meristems, diffusion, osmosis, active transport. Assessment 1 Organisation (pt.1) – The digestive system, enzymes, nutrients in food and food tests, required practical for food tests. 	<ol style="list-style-type: none"> Infection and response (pt.1) – communicable disease, viral, fungal and bacterial diseases, investigating bacteria and growing bacteria, fighting disease and white blood cells, immunity, vaccination, drug trials. Bioenergetics (pt.1) – Plant cells and leaf structure, photosynthesis and testing a leaf for starch, limiting factors, required practical and impact of light intensity on rate of photosynthesis. 	<ol style="list-style-type: none"> Assessment 2 Cell biology (pt.2) – Required practical for osmosis, investigation skills such as graphs and data analysis, perfect exchange surfaces, Organisation (pt.2) – Structure of the lungs and gas exchange, heart structure and function, the circulatory system, blood vessels, stents and statins, artificial hearts and artificial blood, non-communicable disease and risk factors, cancer.
Year 9 (Chemistry) (3 lessons over two weeks)	<ol style="list-style-type: none"> Atomic structure and The Periodic Table (pt.1) – Elements, compounds and mixtures, chemical equations and formulae, separating substances, atomic structure, electronic structure, comparing models of the atom. Bonding structure and the properties of matter (pt.1) – Formation of ions, ionic bonding, properties of ionic substances, covalent bonding, properties of simple covalent and giant covalent substances, metals and alloys, states of matter. Assessment 1 Quantitative Chemistry (pt.1) – Conservation of mass, calculating relative formula mass, calculating percentage composition, mole calculations. 	<ol style="list-style-type: none"> Chemical changes (pt.1) – Acids and alkalis, the pH scale, neutralisation, making salts, acids and carbonates, required practical for making copper sulphate, reactions of acids and metals, displacement. Energy changes – Endothermic and exothermic reactions, reaction profiles, calculating overall energy change from bond energy calculations, cell and batteries, fuel cells. 	<ol style="list-style-type: none"> Assessment 2 Atomic structure and the periodic table (pt.2) – Isotopes and calculating relative abundance, The structure and patterns in the modern Periodic table, The early Periodic table, group 1, 7 and 0 elements and patterns in their reactivity. Structure, bonding and the properties of matter (pt.2) – Structure and properties of simple molecules, structure and properties of giant covalent substances, Properties and applications of graphene and fullerenes, polymers, nanoparticles, and their uses.
Year 9 (Chemistry) (3 lessons over two weeks)	<ol style="list-style-type: none"> Atomic structure and The Periodic Table (pt.1) – Elements, compounds and mixtures, chemical equations and formulae, separating substances, atomic structure, electronic structure, comparing models of the atom. Bonding structure and the properties of matter (pt.1) – Formation of ions, ionic bonding, properties of ionic substances, covalent bonding, properties of simple covalent and giant covalent substances, metals and alloys, states of matter. Assessment 1 Quantitative Chemistry (pt.1) – Conservation of mass, calculating relative formula mass, calculating percentage composition, mole calculations. 	<ol style="list-style-type: none"> Chemical changes (pt.1) – Acids and alkalis, the pH scale, neutralisation, making salts, acids and carbonates, required practical for making copper sulphate, reactions of acids and metals, displacement. Energy changes – Endothermic and exothermic reactions, reaction profiles, calculating overall energy change from bond energy calculations, cell and batteries, fuel cells. 	<ol style="list-style-type: none"> Assessment 2 Atomic structure and the periodic table (pt.2) – Isotopes and calculating relative abundance, The structure and patterns in the modern Periodic table, The early Periodic table, group 1, 7 and 0 elements and patterns in their reactivity. Structure, bonding and the properties of matter (pt.2) – Structure and properties of simple molecules, structure and properties of giant covalent substances, Properties and applications of graphene and fullerenes, polymers, nanoparticles, and their uses.
Year 9 (Physics) (3 lessons over two weeks)	<ol style="list-style-type: none"> Energy (pt.1) – Energy stores and systems, calculating kinetic energy and gravitational potential energy, calculating specific heat capacity, required practical for specific heat capacity, Conduction, convection, insulation. Assessment 1 Electricity (pt.1) – Static electricity, electric fields, building circuits, series and parallel circuits, measuring current and potential difference, resistance and Ohm's law, required practical investigating how length of wire impact resistance. 	<ol style="list-style-type: none"> Particle model – calculating density for regular and non-regular shapes, required practical for density, internal energy, calculating specific latent heat, particle motion and pressure in gasses, Brownian motion. Atomic Structure – Developing the model of the atom, atomic structure, isotopes and radiation, nuclear equations. Energy (pt.2) – Energy transfers and investigating insulation, efficiency, calculating, power, energy resources and their uses. 	<ol style="list-style-type: none"> Assessment 2 Energy (pt.3) – Wind, solar and geothermal power, hydroelectric, tides and wave power, Biofuels and non-renewable resources, trends in energy resource use. Electricity (pt.2) – Resistance, required practical for resistance in series and parallel circuits, V-I graphs, thermistors, LDR's, wiring a plug, calculating power of electrical devices, The national Grid.
Year 10 & 11 will continue to follow the previous order of study to make sure they have covered all topics and are fully prepared for their GCSE exams			
Year 10 (Trilogy) (9 lessons over two weeks)	<ol style="list-style-type: none"> Structure, bonding and the properties of matter – Forming ions, ionic bonding, properties of ionic substances, covalent bonding, properties of simple covalent substances, properties of giant covalent structures, metallic bonding, alloys, polymerisation, states of matter and changes of state. Bioenergetics – Plant cells and leaf structure, photosynthesis and starch test, limiting factors, required practical for photosynthesis and light intensity, respiration and metabolism, anaerobic respiration, effect of exercise. Atomic structure – Plum pudding model of the atom and Rutherford scattering, development of the nuclear model of the atom, isotopes, types of radiation, properties and uses of each type of radiation, half-life, nuclear equations, background radiation. Quantitative Chemistry – Relative formula mass, percentage composition, mole calculations, reacting masses, titrations, concentration calculations. Assessment 1 Homeostasis – The nervous system, Synapses and reflexes, required practical for reaction times, the endocrine system, controlling blood glucose levels, diabetes, adrenaline and thyroxin, puberty, menstrual cycle, fertility hormones, using fertility hormones, contraception. 	<ol style="list-style-type: none"> Waves – Transverse and longitudinal waves, waves experiments and the wave equation, reflection, refraction, electromagnetic waves, properties and uses of electromagnetic waves, infra-red and temperature, required practical for black silver and white cans. Chemistry of the Atmosphere – Formation of sedimentary rocks, fossil fuels, composition of the atmosphere, evolution of the atmosphere, global warming, greenhouse effect, climate change, analysing data and graphs, impact of human activities on the atmosphere, sulphur dioxide and air pollution, carbon footprint. Particle Model – Density and calculating density of regular and irregular objects, motion in gasses, gas pressure, internal energy, changes of state, specific latent heat. Inheritance, Variation and Evolution – Sexual/Asexual reproduction, chromosomes, DNA, proteins and genomes, Meiosis, genetic diagrams, inherited disorders, mutation, variation, antibiotic resistance, evolution, fossils, selective breeding, genetic engineering, classification. 	<ol style="list-style-type: none"> Assessment 2 WORK EXPERIENCE Forces – Contact and non-contact forces, scale diagrams, resolving forces, weight, mass and gravity, work done and power, required practical for Hooke's Law, calculating speed, calculating acceleration, distance-time graphs, required practical for acceleration, velocity-time graphs, Newton's 1st Law, Newton's 2nd Law, Newton's 3rd Law, stopping distances, breaking and thinking distances, momentum, changes in momentum. Organic Chemistry – Crude oil, alkanes, fractional distillation, cracking, alkenes. Investigation skills – Method writing, results tables, collecting results, drawing graphs, maths skills, averages, standard form, conclusions, evaluations etc.

	Energy Changes – Endothermic and exothermic reactions, reaction profiles, required practical for energy changes, bond energy calculations.		
Year 10 (Biology)	<ol style="list-style-type: none"> Homeostasis and response (pt.1) – The nervous system, synapses and reflexes, requires practical for reaction times, the brain, the eye, the endocrine system, controlling body temperature, controlling blood glucose concentration, diabetes, controlling blood water concentration. Assessment 1 Homeostasis and response (pt.2) – Kidney failure and dialysis, plant hormones and auxins, puberty, the menstrual cycle, fertility hormones, using fertility hormones. 	<ol style="list-style-type: none"> Homeostasis and response (pt.3) – Contraception, plant hormones, commercial uses for plant hormones. Inheritance, variation and evolution – DNA, protein synthesis, mutations, mitosis and meiosis, sexual and asexual reproduction, genetic diagrams, inheriting disorders, variation, evolution and natural selection, Darwin and Lamarck, extinction, selective breeding, genetic engineering, cloning. 	<ol style="list-style-type: none"> Assessment 2 WORK EXPERIENCE Ecology – Competition, food chains and webs, abiotic and biotic factors, adaptations, extremophiles, collecting ecological data, quadrats, transects, the water cycle, the carbon cycle, decay, biodiversity and waste management, global warming, deforestation, land use and peat bogs, trophic levels, pyramids of biomass, food security and farming, fish stocks, biotechnology.
Year 10 (Chemistry)	<ol style="list-style-type: none"> Rate of reaction – Collision theory, required practical concentration, surface area, temperature, catalysts, calculating rate of reaction from graphs, tangents, reversible reactions, Le Chateliers Principle. Assessment 1 Chemical analysis (pt.1) – Purity and formulations, chromatography and Rf values, testing for gases. 	<ol style="list-style-type: none"> Chemical analysis (pt.2) – testing for cations flame tests, testing for cations precipitation, testing for anions carbonates, testing for anions sulphates, testing for anions halides, required practical testing for unknown compounds s=using chemical tests, flame emission spectroscopy. Organic chemistry – Crude oil and alkanes, fractional distillation, cracking, alkenes, testing for saturation, addition polymerisation, hydrogenation, making ethanol ethane and fermentation, alcohols, carboxylic acids, esters. 	<ol style="list-style-type: none"> Assessment 2 WORK EXPERIENCE Chemistry of the atmosphere – Composition of the atmosphere, evolution of the atmosphere, global warming, data analysis from tables and graphs, impact of human activities on the atmosphere, peat bogs, carbon footprint, the greenhouse effect, plastics and recycling.
Year 10 (Physics)	<ol style="list-style-type: none"> Space physics – The universe and the solar system, lifecycle of stars, orbits and satellites, The Big Bang Theory, Evidence for The Big Bang Theory. Forces (pt.1) – Contact and non-contact forces, weight, mass and gravity, centre of mass, force diagrams, resolving forces, scaled balanced forces, work done, Hooke's Law. Assessment 1 Forces (pt.2) – Required practical for Hooke's Law, moments, fluid pressure, distance, displacement, speed and velocity. 	Forces (pt.3) – distance-time graphs, acceleration, velocity-time graphs, required practical for acceleration, terminal velocity, Newton's 1 st Law, Newton's 2 nd Law, stopping distances, thinking and breaking distances, momentum, change in momentum, car safety and momentum.	<ol style="list-style-type: none"> Assessment 2 WORK EXPERIENCE Magnetism and electromagnets – Permanent and induced magnets, electromagnetism theory, investigating electromagnets, the motor effect theory, building an electric motor, loudspeakers, the generator effect, microphones, transformers.
Year 11 (Trilogy) (8 lessons over two weeks)	<ol style="list-style-type: none"> Rate of Reaction – collision theory, required practical investigating concentration, temperature, surface area, catalysts, calculating rate of reaction from a graph, tangents and gradients, endothermic and exothermic reactions, Le Chatelier's Principle. Magnetism and Electromagnets – Permanent and induced magnets, electromagnets, investigating electromagnets, right hand rule, the motor effect, left hand rule, electric motors, applications of the motor effect. Using Resources – Finite and renewable resources, reuse and recycle, life cycle assessments, potable water and waste water treatments, required practical purification, required practical finding mass of a solute. Assessment 1 Forces – Contact and non-contact forces, scale diagrams, resolving forces, weight, mass and gravity, work done and power, required practical for Hooke's Law, calculating speed, calculating acceleration, distance-time graphs, required practical for acceleration, velocity-time graphs, Newton's 1st Law, Newton's 2nd Law, Newton's 3rd Law, stopping distances, breaking and thinking distances, momentum, changes in momentum. 	<ol style="list-style-type: none"> Inheritance, Variation and Evolution – Sexual/Asexual reproduction, chromosomes, DNA, proteins and genomes, Meiosis, genetic diagrams, inherited disorders, mutation, variation, antibiotic resistance, evolution, fossils, selective breeding, genetic engineering, classification. Assessment 2 Revision - Lessons will be revision based until the GCSE exams. These lessons will be determined from analysis of both sets of mock exams using questions level analysis (QLA's) to inform teachers and students of topics and skills that need extra attention during lessons and intervention. 	<p style="text-align: center;">TBD</p> <p style="text-align: center;">Lessons will be revision based until the GCSE exams. These lessons will be determined from analysis of both sets of mock exams using questions level analysis (QLA's) to inform teachers and students of topics and skills that need extra attention during lessons and intervention.</p>
Year 11 (Biology)	<ol style="list-style-type: none"> Cell biology – Movement in and out of cells, mitosis and binary fission, stem cells. Organisation – Required practical for enzymes, cardiovascular system, Required practical for food tests, transpiration and translocation. Assessment 1 Infection and Response – Diseases, fighting diseases, developing drugs, monoclonal antibodies, plant defences. 	<ol style="list-style-type: none"> Homeostasis and Response – The nervous system, the brain, the eye, the endocrine system, controlling temperature, blood glucose, blood water concentration, fertility. Inheritance, Variation & Evolution – DNA structure, mutations, reproduction, meiosis, genetic diagrams, evolution, selective breeding, genetic modification, cloning. Assessment 2 Ecology – Required practical for quadrats, line transects, explaining ecosystems, required practical for decay, the water cycle and the carbon cycle, maintaining biodiversity, trophic levels and pyramids of biomass, food security and biotechnology. 	<p style="text-align: center;">TBD</p> <p style="text-align: center;">Lessons will be revision based until the GCSE exams. These lessons will be determined from analysis of both sets of mock exams using questions level analysis (QLA's) to inform teachers and students of topics and skills that need extra attention during lessons and intervention.</p>
Year 11 (Chemistry)	<ol style="list-style-type: none"> Quantitative chemistry – Relative formula mass, percentage composition, moles and reacting masses, yield and atom economy, gases and solutions, titration, concentration calculations. Assessment 1 	<ol style="list-style-type: none"> Structure, bonding and properties of matter – Ionic bonding, covalent bonding, comparing structures of diamond, graphite, graphene, properties of ionic substances and simple covalent substances. Chemical changes – Electrolysis, redox reactions. 	<p style="text-align: center;">TBD</p> <p style="text-align: center;">Lessons will be revision based until the GCSE exams. These lessons will be determined from analysis of both sets of mock exams using questions level analysis (QLA's) to inform teachers and students of topics and skills that need extra attention during lessons and intervention.</p>

	<p>3. Chemical changes – Required practical for making salts, electrolysis. Using Resources – Potable water, waste water, lifecycles.</p>	<p>3. Assessment 2 4. Rate of Reaction – Equilibrium, The Haber Process. Organic Chemistry – Alkanes, fractional distillation, alkenes, polymers.</p>	
<p>Year 11 (Physics)</p>	<p>1. Atomic structure – Modern theory of the atom, development of the model of the atom, types of radiation, uses of radiation, nuclear equations, half-life, background radiation and contamination, Chernobyl and nuclear power, nuclear fission, nuclear fusion. 2. Energy – Energy stores and transfers, conduction, convection, insulation, required practical for specific heat capacity, energy sources. 3. Assessment 1 4. Electricity – Series and parallel circuits, required practical for investigating resistance, electricity equations, static electricity and electric fields. Particle model of matter – Required practical for density, internal energy, specific latent heat calculations, gas motion and pressure.</p>	<p>1. Atomic structure – types of radiation, structure of the atom, nuclear equations, half-life, contamination, nuclear fission, nuclear fusion. 2. Forces – Contact and non-contact forces, weight, mass and gravity, force diagrams, Hooke's Law, fluid pressure, moments, motion graphs, Newton's Laws, stopping distances, momentum. 3. Space Physics – Lifecycle of stars, orbits and satellites, evidence for The Big Bang Theory. 4. Assessment 2 5. Waves – Types of wave and properties, EM waves, lenses. Magnetism and Electromagnetism – Magnets and electromagnets, the motor effect, Electromagnetic induction, transformers.</p>	<p style="text-align: center;">TBD</p> <p style="text-align: center;">Lessons will be revision based until the GCSE exams. These lessons will be determined from analysis of both sets of mock exams using questions level analysis (QLA's) to inform teachers and students of topics and skills that need extra attention during lessons and intervention.</p>

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