Key Stage 4 'My World' Teaching and Learning Framework

The 'My World' curriculum aims to foster a love of learning and engage students from a young age. Our pupils will develop a sense of belonging and responsibility through having a better understanding of the world, and by applying learning to real-life problems and contexts. They will be able to access the world around them as independently and safely as possible due to having a better awareness of the risks and hazards within their world and an understanding of how their body works. Students will be able to understand environmental issues through the promotion of problem-solving skills and experiences from their own lives.

Integral to the delivery of the 'My World' curriculum is allowing students regular opportunities to ask questions, make predictions, plan investigations and evaluate their results. These skills will support students' understanding and promote independence.

Students will be able to make links between the theory of how and why the world works to how this happens in practice. They will develop problem-solving skills and will be able to apply their learning to real life contexts, providing opportunities to reinforce and build on prior learning. Pupils will also be given the opportunity to deepen their understanding through other curriculum areas and relating learning to their personal experiences.

'My World' is taught every week throughout the school year. Our curriculum follows a three year cycle, allowing opportunities for pupils to access a breadth of study. The curriculum is designed for pupils who are encountering and developing. Pupils at the encountering stage, will follow the curriculum topics with a view to achieving unit awards for each topic. Pupils at the developing stage, will be working towards the OCR Entry Level science qualification. Pupils learning at the enhancing stage attend mainstream lessons and will be working towards achieving a GCSE qualification in science. Pupils with PMLD and SLD will follow the encountering objectives as part of their 'My Engagement' curriculum.

Cycle One			
Autumn 1		**Autumn 2**	
Clean air and water ELC4/ Sorting Out ELC6 **Unit Awards:** 113349: SEPARATING SOLID MATERIALS WITH SUPPORT		**CSI Plus ELC12/ Practical Task** **Unit Awards:** 113620: CRIME SCENE INVESTIGATION	
Encountering	**Developing**	**Encountering**	**Developing**
• Pupils will be able to take part in at least two group investigations to separate solid materials from a mixture • Pupils will be able to choose the appropriate apparatus to separate a given mixture of solids • Pupils will be able to separate rice from dried peas, soil from	• Pupils will be able to know that the Earth is surrounded by a mixture of gases called the atmosphere. • Pupils will be able to know how the atmosphere was formed and has changed over time • Pupils we will be able to know that the atmosphere now contains about 80% nitrogen and 20% oxygen	• Pupils will be able to carry out paper chromatography with support • Pupils will be able to work together to match shoe prints to another person • Pupils will be able to work together to match fingerprints to people in the classroom • Pupils will be able to work together to match a material in the classroom to an item of	• Pupils will be able to know that anyone present at a crime scene will leave some evidence behind • Pupils will be able to understand why crime scene investigators wear special clothing to avoid leaving evidence at a crime scene • Pupils will be able to know how an investigator collects evidence at a crime scene - in precisely labelled bags • Pupils will be able to know

pebbles and marbles from tennis balls • Pupils will know how to use a sieve.	• Pupils will be able to know that there are smaller amounts of water, vapour, carbon dioxide and other gases in the air • Pupils will be able to know that fuels contain carbon, which forms carbon dioxide when the fuel burns • Pupils will be able to know how to test for the presence of carbon dioxide • Pupils will be able to know that the amount of carbon dioxide in the atmosphere is slowly increasing • Pupils will be able to know that the increasing level of carbon dioxide is linked to global warming • Pupils will be able to know that burning	clothing • Pupils will be able to use the above points to identify one person in the classroom. • Pupils will have observed a member of staff carrying out a flame test • Pupils will explore an object using a microscope.	fingerprints are left on a surface because oils from the skin are deposited • Pupils will be able to know how dusting a surface with a special powder can make fingerprints show up • Pupils will be able to know how fingerprints can be removed from a surface • Pupils will be able to know how to make a record of a person's fingerprints • Pupils will be able to understand that innocent people have their fingerprints taken for elimination • Pupils will be able to recognise loop, arch and whorl as features of fingerprints • Pupils will be able to know that no two people have identical fingerprints, not even twins • Pupils will be able to know that blood contains red

	fuels may add harmful chemicals into the atmosphere • Pupils will be able to know that these harmful chemicals are called pollutants • Pupils will be able to understand some of the problems these pollutants cause • Pupils will be able to explain what is meant by the purity of a substance, distinguishing between the scientific and everyday use of the term 'pure' • Pupils will be able to know that a mixture contains two or more uncombined substances • Pupils will be able to know that mixtures contain substances that can be separated		blood cells, white blood cells, platelets and plasma • Pupils will be able to recall that the main blood groups are A, B, AB and O • Pupils will be able to know how chromatography can be used to separate colours in ink • Pupils will be able to understand how the results of separating colours can identify a particular ink as being used e.g. to write a forged cheque • Pupils will be able to know that DNA is inherited from parents • Pupils will be able to know that identical twins have identical DNA but otherwise DNA is uniques • Pupils will be able to interpret data from a crime scene and decide whether or not if confirms a suspect's presence.

	from each other • Pupils will be able to suggested suitable separation techniques given information about the substances • Pupils will be able to plan how to obtain a soluble substance from an aqueous solution by crystallisation • Pupils will be able to plan how to separate an insoluble substance from water by filtration • Pupils will be able to know how chromatography is used to separate mixtures into their constituents • Pupils will be able to interpret simple chromatograms • Pupils will be able to suggest how chromatography can be used to test pure		

	from impure substances • Pupils will be able to follow a chromatography experiment to measure the distance moved by the solvent and the spots • Pupils will be able to calculate the Rf value from the spots by dividing the distance moved by the spot by the distance moved by the solvent • Pupils will be able to understand that distillation is used to separate liquid with different boiling points • Pupils will be able to know that distillation is used to produce some alcoholic drinks • Pupils will be able to use melting point data to distinguish pure		

	from impure substances • Pupils will be able to know how drinking water is purified		
Spring 1		**Spring 2**	
Fly Me to the Moon/ Final Frontiers ELP11 **Unit Awards:** 115347: Physics Unit 1: SPACE		**Attractive Forces/ Practical Task ELP8** **Unit Awards:** 117330: STARTING TO EXPLORE FORCES	
Encountering	**Developing**	**Encountering**	**Developing**
• Pupils will be able to name at least two things that can be seen in the sky at night.Pupils will know that there are planets in our solar system. • Pupils will show some knowledge of what causes day and night • Pupils will know that the moon orbits the earth • Pupils will be able to research a planet	• Pupils will know that the moon orbits the earth • Pupils will know the order of the eight planets in the solar system • Pupils will be able to interpret information about the planets and other bodies in the universe • Pupils will be able to know that other planets have moons	• Pupils will be able to observe and begin to identify objects that float and sink • Pupils will be able to stick magnets to at least two different objects • Pupils will be able to find two objects in the classroom that stick to magnets with support. • Pupils will be able to make at least two objects move faster or slower.	• Pupils will be able to know that iron and steel are magnetic • Pupils will be able to know how to induce magnetism in a pin • Pupils will be able to know that magnets attract magnetic materials: limited to iron and steel • Pupils will be able to know that like poles repel and unlike poles attract • Pupils will be able to know how iron filings or a

	• Pupils will be able to know that large rockets are needed to put things in space • Pupils will be able to apply Newton's first law to explain why a rocket on a launch pad remains where it is before take off • Pupils will be able to know that Newton's second law is used by scientists to work out how the rocket lifts off the pad relating forces, masses and accelerations • Pupils will be able to explain how the thrust of the rocket is provided by heating a gas to increase its volume • Pupils will be able to explain how the motion of the molecules in a gas is related both to	• Pupils will have explored making a parachute • Pupils will be able to take part in dropping different parachutes and state whether they have moved faster or slower, using their preferred method of communication • Pupils will have experienced playing games with magnets • Pupils will have explored how cars behave when they are moving on different surfaces.	compass can be used to show up a magnetic field • Pupils will be able to know that a freely swinging magnet comes to rest in a N-S direction • Pupils will be able to know that the Earth has a magnetic field around it • Pupils will be able to understand how a compass works and why it is so useful • Pupils will be able to the Earth's magnetic field protects us from cosmic rays • Pupils will be able to know that a current-carrying wire behave like a magnet • Pupils will be able to know how to construct an electromagnet • Pupils will be able to understand how the strength of an electromagnet depends on: the number of turns on

	its temperature and its pressure • Pupils will be able to explain what would happen if you had a blockage in a rocket motor • Pupils will be able to recall Newton's third law to the forces of the rocket • Pupils will be able to apply Newton's law to explain why the rocket in space keeps a constant speed • Pupils will be able to know that some parts of some rockets/shuttles return to the Earth and can be reused • Pupils will be able to understand that manned spacecraft need resources that unmanned spacecraft do not e.g. food		the coil, the current in the coil • Pupils will be able to understand that the core of an electromagnet is made of iron because iron is a temporary magnet • Pupils will be able to know that the strength of the field depends on the curry and the distance from the conductor and explain how solenoid arrangements can enhance the magnetic effect. • Pupils will be able to label the magnet, core and cone in a loudspeaker • Pupils will be able to plan how to compare how the number of turns on the coil (or strength of magnet) affects how well a loudspeaker works • Pupils will be able to recall uses of electromagnets limited to: MRI scan,

	oxygen water • Pupils will be able to know that other artificial satellites orbit the earth and are used for communication, mapping, spying and tracking		sorting scrap metals, lifting iron/steel/cars
Summer 1		**Summer 2**	
Extinction ELB10 Body Wars ELB8 **Unit Awards:** 118741 LEARNING ABOUT ROCKS AND FOSSILS		**Creepy Crawlies ELB9; Alternative Energy ELP5** **Unit Awards:** 113929: FOOD CHAINS	
Encountering	**Developing**	**Encountering**	**Developing**
• Pupils will be able to sort different rocks into groups based on given properties eg size. • Pupils will be able to select criteria to classify given rocks	• Pupils will be able to know that fossils provide evidence of living orgasms from long ago to include fossil formation • Pupils will be able to know that living things have been changing through evolution	• Pupils will know that different animals eat different foods • Pupils will be able to identify the animals on a farm that eat plants. • Pupils will be able to identify animals on a farm that eat meat. • Pupils will be able to	• Pupils will be able to know that animals get their food from eating plants or other animals. • Pupils will be able to know that many different materials cycle through an ecosystem • Pupils will be able to explain the importance of

• Pupils will be able to make comparisons between given fossils • Pupils will be able to identify that fossils are found underground. • Pupils will be able to describe a fossil in simple tems using their preferred method of communication. • Pupils will be able to recognsie that a fossil shows the remains of a plant or animal. • Pupils will be able to group fossils into mould, casts and resin with support • Pupils will be able to list the main ways we use different types of rocks.	• Pupils will be able to understand the term species • Pupils will be able to know that some species have changed very little over thousands of years e.g. crocodiles • Pupils will be able to identify variations in animals or plants of the same specials • Pupils will be able to know that all variations in a species arise from mutations • Pupils will be able to understand that living things compete for shelter, food and mates in order to survive • Pupils will be able to know that the better adapted individuals will survive and can breed and pass on	discuss the different types of food that they eat. • Pupils will be able to create a simple food chain with support. • Pupils will have a experienced feeding animals on a farm	the carbon cycle and the water cycle to living organisms • Pupils will be able to explain that microorganisms are involved in the cycling of materials through an ecosystem • Pupils will be able to understand how some animals are adapted as successful predators • Pupils will be able to understand the terms herbivore and carnivore • Pupils will be able to construct a simple food chain with a plant, herbivore and carnivore • Pupils will be able to interpret a simple food web (limited to 3 organisms at any level) • Pupils will be able to understand how a change affecting one species in a food web can affect

	their features to the next generation • Pupils will be able to understand the term habitat • Pupils will be able to understand that a species may become extinct if their habitat changes or another species is better adapted to survive there • Pupils will be able to understand how human beings have caused some species to become endangered or extinct: habitat destruction, hunting, pollution • Pupils will be able to describe the relationship between health and disease • Pupils will be able to describe different types of diseases		another species in the same food web • Pupils will be able to describe and carry out simple sampling methods, limited to pooters, nets, pitfall traps and quadrat surveys • Pupils will be able to use simple keys to name plants and animals • Pupils will be able to describe that DNA is now used to help classify organisms • Pupils will be able to know the meaning of the term habitat • Pupils will be able to understand that organisms are adapted to live in their habitat • Pupils will be able to estimate the number of plants in an area using results of a quadrat survey • Pupils will be able to

	• Pupils will be able to know that if you are infected with two diseases it may make you feel worse • Pupils will be able to know that plants can get diseases too • Pupils will be able to recall that harmful microbes are bacteria, fungi, protists and viruses • Pupils will be able to describe a minimum of one common human infection plus a sexually transmitted infection in humans • Pupils will be able to understand that our bodies provide good conditions for microbes to reproduce rapidly • Pupils will be able to recall that the skin, chemicals in tears, sweat and stomach		describe the impact of humans on biodiversity • Pupils will be able to explain some of the reasons why scientists want to maintain biodiversity • Pupils will be able to understand that every power station needs an energy source • Pupils will be able to recall that crude oil, coal and natural gas are fossil fuels used in power stations • Pupils will be able to understand that fossil fuels are a limited energy source • Pupils will be able to know that burning fossil fuels are a limited energy source • Pupils will be able to know that burning fossil fields produces carbon dioxide which is a greenhouse gas • Pupils will be able to know

	acid stop microbes getting in. • Pupils will be able to know that microbes cane nter the body through natural opening, or cuts in the skin • Pupils will be able to know that white blood cells are part of the immune system • Pupils will be able to know that the immune system fights infections • Pupils will be able to explain how white blood cells, platelets and plasma are adapted to their functions in the blood • Pupils will be able to describe the process of discovery and development of new medicines • Pupils will be able to		that greenhouse gases contribute to global warming • Pupils will be able to understand that the demand for energy is increasing and this mean that renewable sources will become more important • Pupils will be able to know that some energy sources are renewable: wind, sunlight, waves, tide, geothermal, hydro-electric, biomass • Pupils will be able to interpret information about the demand for energy and the availability of energy sources • Pupils will be able to know that wind turbines use energy from the wind to generate electricity • Pupils will be able to know that the up and down

	know that antibiotics are chemicals the kill bacteria and fungi, not viruses • Pupils will be able to know that bacteria have evolved which are not killed by some antibiotics • Pupils will be able to know that vaccines can make people immune to a disease • Pupils will be able to know that a vaccine usually contains a safe form of a disease causing microorganism • Pupils will be able to know that once you are immune you are protected from a particular disease • Pupils will be able to understand different viewpoints that parents may have about giving their child		movement of water in a wave can be used to turn a turbine and so generate electricity • Pupils will be able to describe in simple terms wave motion in terms of amplitude, wavelength, frequency and period • Pupils will be able to define wavelength and frequency and describe and apply the relationship between these and the wave velocity • Pupils will be able to describe how ripples on water surfaces are examples of transverse waves and how the speed of each may be measured; describe evidence that it is the wave and not the water or air itself that travels. • Pupils will be able to describe the difference between transverse and

	a vaccination • Pupils will be able to understand that media reports of health studies are not always accurate		longitudinal waves • Pupils will be able to know that the sun is a course of energy • Pupils will be able to know that photocells transform light into electrical energy • Pupils will be able to know that photocells produce direct current • Pupils will be able to understand that photocells are useful sources of electricity for remote locations • Pupils will be able to know that heating a house requires a lot of energy and that alternative sources of heating can be used • Pupils will be able to know that radiation fro the sun can be absorbed by a surface and transferred into heat • Pupils will be able to describe an experiment to

			show that black matt surfaces absorb more energy than white shiny surfaces • Pupils will be able to know that solar panels have circulating water which is heated by radiation from the sun

Cycle Two			
Autumn 1		**Autumn 2**	
Are you Overreacting? ELC10; How Fast? How slow? ELC11 **Unit Awards:** 118668 CHEMISTRY: CHEMISTRY IN OUR WORLD		**Practical Task** **Getting the Message- communicating through wires ELP1** **Unit Awards:** 119480 EXPLORING SOUND AND RHYTHM	
Encountering	**Developing**	**Encountering**	**Developing**
• Pupils will be able to explore the transfer of energy in the form of heat eg hair dryers, hand warmers	• Pupils will be able to know that the rates of chemical reactions can vary greatly • Pupils will be able to	• Pupils will be able to make a sound with their hands and feet • Pupils will be able	• Pupils will be able to describe how sound waves in air are longitudinal waves • Pupils will be able to explain how the motion of the

• Pupils will observe a chemical reaction • Pupils will be able to explore how cold is transferred. • Pupils will be able to use a bath bomb in water and observe what happens • Pupils will be able to observe two different kinds of renewable energy resource • Pupils will be able to show how yeast reaction helps us make bread.	interpret simple visual images showing different rates of chemical reactions • Pupils will be able to know that a reaction stops when one of the reacting substances is used up • Pupils will be able to know that a reaction can go forwards or backwards and that a reaction may finish when the rate of the forward reaction may equal the rate of backward reaction • Pupils will be able to deduce an order of reactivity of alkali metals based on their reaction with water • Pupils will be able to know that the reactivity of metals with water or dilute acids is related to the tendency of the	to make a sound with their mouth. • Pupis will be able to make a sound by tapping. • Pupils will be able to recognise a change in tempo. • Pupils will be able to clap and drum along to given songs. • Pupils will have explored various rhythms using body percussion and instruments.	molecules in a gas is related to its pressure • Pupils will be able to know that even when whispering voice can be overheard • Pupils will be able to know that coding a message increases its security • Pupils will be able to understand that light can be used for communication but requires the use of digital code e.g. morse code • Pupils will be able to know that digital signals are either on (1) or off (0) • Pupils will be able to know that light travels through space at a speed of 300,000 km/s • Pupils will be able to understand how using light allows messages to be transmitted quickly • Pupils will be able to understand how light travels along an optical fibre from one end to the other by reflection • Pupils will be able to know that

	metal to form its positive charge the easier the positive charge is formed the more reactive it is • Pupils will be able to predict possible reactions and probable reactivity of elements from their positions in the periodic table to group 1,7 and 0. • Pupils will be able to know that magnesium, zinc and iron react with acids to make hydrogen gas • Pupils will be able to know the test for hydrogen • Pupils will be able to deduce an order of reactivity of magnesium, zinc and iron based on their reaction with acid • Pupils will be able to know ways of		optical fibres transmit data very quickly • Pupils will be able to know that light is not the only method of transmitting a signal digitally there are other examples which the electromagnetic spectrum • Pupils will be able to know that household remote control devices use infrared radiation • Pupils will be able to know that wireless communication devices use radio waves • Pupils will be able to understand the advantages of wireless technology for radio, mobile telephones and laptops • Pupils will be able to know that mobile phones use microwave signals • Pupils will be able to know that sound and images can be transmitted digitally • Pupils will be able to know that the main reason for switching to digital television and radio is the improved quality of

	monitoring the progress of a reaction • Pupils will be able to interpret information from charts about rates of reaction • Pupils will be able to understand how particle collisions can be used to explain reaction rates • Pupils will be able to know that increasing temperature usually speeds up chemical reactions • Pupils will be able to know that lowering the temperature (In a fridge or freezer) slows down the changes that make food go bad • Pupils will be able to know the increasing the concentration increases the speed of a chemical reaction • Pupils will be able to		picture and sounds

	label simple laboratory apparatus used to find out about rates of reaction limited to: beaker, flask, measuring cylinder, thermometer, stirring rod, test tube, gas syringe, top pan balance, stop clock • Pupils will be able to know that the rate of reaction is increased when several small lumps of solid are used rather than a few large lumps • Pupils will be able to understand that a difference in the rate of reaction can be explained by a difference in the surface area • Pupils will be able to know that catalysis can alter the rate of reaction but are not		

	used up in a reaction • Pupils will be able to explain that to get a reaction to start often energy has to be supplied • Pupils will be able to state the activation energy is the energy that needs to be added to start a chemical reaction • Pupils will be able to label the activation energy on a graph showing the energy profile of a reaction • Pupils will be able to interpret simple information on the use of different catalysts • Pupils will be able to know that enzymes act as catalysts in biological systems		
Spring 1		**Spring 2**	
Full spectrum- colours and light ELP2; Medical Rays- X-rays		**Babies ELB2; My Genes ELB11**	

and Bones ELP3 **Unit Awards:** 117720 MIXING PAINT TO MAKE A COLOUR WHEEL WITH SUPPORT		**Unit Awards:** 115340: HUMAN REPRODUCTION	
Encountering	**Developing**	**Encountering**	**Developing**
• Pupils will be able to recognise the three primary colours. • Pupils will be able to recognise and label the three secondary colours • Pupils will be able to mix different pairs of primary colours to make at least two secondary colours. • Pupils will be able to mix paints to produce a third colour and be able to identify the colour created. • Pupils will be able to produce a colour wheel to display the primary and secondary colours.	• Pupils will be able to know that visible light is part of a group of waves called the electromagnetic spectrum • Pupils will be able to know that all waves from the electromagnetic spectrum travel at the speed of light • Pupils will be able to list the colours of the visible spectrum in order from red to violet • Pupils will be able to know that a rainbow is a naturally occurring example of visible spectrum	• Pupils will be able to match at least two adult animals and their offspring. • Pupils will be able to sequence the main stages of the human life cycle. • Pupils will show some understanding of the male reproductive system. • Pupils will show some knowledge of the female reproductive system.	• Pupils will be able to recall the names of the main organs of the female reproductive system: ovary, oviduct, womb and vagina • Pupils will be able to recall the name of the main organs of the male reproductive system: penis, testis, sperm duct • Pupils will be able to recall the functions of testes (make sperm), ovary (make eggs) • Pupils will be able to recall that normal body cells have 46 chromosomes: females have 23 pairs (including xx); males have 22 pairs and an odd pair (xy) • Pupils will be able to know that sperm and egg cells have 23 chromosomes each

	• Pupils will be able to know that a visible spectrum can be produced when white light passes through a prism • Pupils will be able to know that a laser produces a narrow, intense beam of light • Pupils will be able to recall uses of lasers limited to: read CDs, light shows, pointers, weapon guidance, cutting tools • Pupils will be able to know that warm and hot objects emit infrared radiation • Pupils will be able to know that passive infrared sensors and thermal imaging cameras work by detecting body heat. • Pupils will be able to know that infrared is	• Pupils will be able to show some knowledge of how babies are conceived.	• Pupils will be able to know that fertilisation occurs by the fusion of a sperm and an egg cell, which produces a fertilised egg with 46 chromosomes • Pupils will be able to recall that the fertilised egg develops into a foetus • Pupils will be able to know that placenta is the exchange surface used to transfer substances between the mother and foetus and what happens to it after child birth • Pupils will be able to know that chemicals called hormones are involved in reproduction to include male: testosterone and female: oestrogen and progesterone • Pupils will be able to recall some of the changes that occur in the female body after fertilisation : stopping period and gaining weight • Pupils will be able to know that periods start again after

	useful for: remote control for TV, short distance data links for computer or mobile phone, night photography, burglar alarms, heating things • Pupils will be able to recall two examples of uses of microwave radiation from cooking, mobile phones, radar, communication with satellites • Pupils will be able to know that microwaves cause heating when absorbed by water or fat and this is the basis of microwave cooking • Pupils will be able to know that radio waves produce electrical signals in metal aerials • Pupils will be able to recall two examples of uses of radio waves - radio, wireless links for		childbirth • Pupils will be able to explain the use of hormones in contraception and evaluate hormonal and non-hormonal methods of contraception • Pupils will be able to recall the name of the main organs • Pupils will be able to know that human cells contain a nucleus. • Pupils will be able to know that the nucleus contains chromosomes which can be seen with a light microscope during cell division but can be seen in greater detail with an electron microscope • Pupils will be able to know that chromosomes are made of DNA • Pupils will be able to describe DNA as two strands forming a double helix • Pupils will be able to know that lengths of DNA in chromosomes are genes • Pupils will be able to know that our DNA carries our unique

	laptops • Pupils will be able to understand the advantages of wireless technology for global communications • Pupils will be able to understand the difference between the diagnosis of an illness and its treatments • Pupils will be able to recall some benefits of a doctor being able to see inside a patient's body • Pupils will be able to know that all surgical procedures have risks • Pupils will be able to recalls some medical uses of UV radiation • Pupils will be able to know that exposure to UV radiation can cause suntan/burn and skin cancer • Pupils will be able to		genetic code • Pupils will be able to describe the genome as the entire genetic material of an organism • Pupils will be able to know that most human features are determined by a person's genes • Pupils will be able to classify a range of human features as genetic: e.g. tongue rolling, ear lobes, environmental e.g. scars, accent and both e.g. hair colour, good at sport • Pupils will be able to understand that environment also affects many features • Pupils will be able to understand that most features are affected by several genes e.g. height • Pupils will be able to interpret data on human variation • Pupils will be able to know that some genes are dominant and some are recessive • Pupils will be able to know how

	understand that the use of UV radiation involves balancing benefits against risk • Pupils will be able to recall some ways of reducing the risk of exposure to UV radiation • Pupils will be able to interpret data on the use of sunscreens • Pupils will be able to understand that bone absorbs x-rays and so produces shadow pictures • Pupils will be able to know that too much exposure to X-rays is dangerous • Pupils will be able to understand that the use of x-rays involves balancing benefits against risks • Pupils will be able to know that gamma		to use simple Punnet squares to show inheritance of genotype ratios • Pupils will be able to know that some diseases are caused by faulty genes • Pupils will be able to know that embryos can be tested for certain genes • Pupils will be able to understand that people have different viewpoints about such testing

	radiation is very penetrating • Pupils will be able to know that a gamma camera detects gamma radiation and that a computer linked to it can make pictures • Pupils will be able to know that exposure to gamma rays is dangerous • Pupils will be able to understand that the use of gamma rays involves balancing benefits against risks • Pupils will be able to know that UV radiation, x-rays and gamma rays are part of a family called the electromagnetic spectrum • Pupils will be able to know that UV radiation, x rays and gamma rays can damage living cells.		

Summer 1		Summer 2	
Our Electricity Supply ELP7; Hot Stuff- safety in the home ELP4 **Unit Awards:** 117364 ELECTRICITY		**Control Systems ELB3 Fooling Your Senses ELB4** **Unit Awards:** 118489 STARTING TO LEARN ABOUT THE HUMAN BODY	
Encountering	**Developing**	**Encountering**	**Developing**
• Pupils will be able to identify at least two appliances that run on electricity. • Pupils will be able to make a circuit using a battery, lamp and wires. • Pupils will know how to keep safe around electricity. • Pupils will know at least three circuit symbols. • Pupils will explore which materials conduct electricity with support.	• Pupils will be able to explain the difference between direct and alternating voltage • Pupils will be able to know that batteries produce dc. electricity from chemical reactions • Pupils will be able to know that the domestic supply in the UK is a.c. at 50 Hz and about 230 volts • Pupils will be able to know the main stages in the production of electricity: heat from the energy source changes water into	• Pupils will be able to list the five human senses. • Pupils will be able to name and locate key parts of the human body, including those related to the senses. • Pupils will be able to draw the features of a human body. • Pupils will be able to name and label the main external parts of the human body.	• Pupils will be able to understand that changes in our surrounding can affect our surroundings can affect our body's internal environment • Pupils will be able to understand that the body's internal environment can change and that the body tries to control this change, use temperature regulation as an example • Pupils will be able to know the ways the body gains or loses water • Pupils will be able to be able to name and locate the kidneys and the bladder • Pupils will be able to know that

	steam, the steam is used to rotate turbines, turbines turn a generator and the generator produces electricity • Pupils will be able to understand the terms insulator and conductor • Pupils will be able to know that electricity is transferred from a power station through a grid of high voltage transmission lines • Pupils will be able to understand that transformers are required at either end of the transmission lines to increase or decrease voltage • Pupils will be able to know that a transformer is two coils of wire wound onto a core of iron • Pupils will be able to	• Pupils will be able to sequence a series of five pictures showing the human life cycle. • Pupils will be able to identify the key things that humans need to stay alive.	kidneys remove excess water and urea • Pupils will be able to know that blood sugar levels need to be controlled • Pupils will be able to know that the body controls blood sugar levels with insulin • Pupils will be able to be able to name and locate the pancreas • Pupils will be able to know that insulin is produced by the pancreas • Pupils will be able to know that diabetes can be managed by controlling sugar levels in the diet and use of insulin • Be able to label a diagram of the eye (limited to cornea, iris, pupil, lens, reina, optic nerve) • Pupils will be able to recall the job of the pupil, lens, retina, optic nerve and iris • Pupils will be able to know that the nose is lined with nerves sensitive to chemicals in the air • Pupils will be able to recall that

	know that electricity in the home is conducted by wires • Pupils will be able to know the difference in function between the live, neutral and earth mains wires, and the potential differences between these wires, hence explain that a live wire may be dangerous even when a switch in a mains circuit is open and explain the dangers of providing any connection between the live wire and earth • Pupils will be able to know that current is a rate of flow of charge, that for a charge to flow, a source of potential difference and a closed circuit are needed and that a current has the same		taste buds are located on the tongue and are sensitive to four tastes, salt, sweet, sour, bitter • Pupils will be able to know that different areas of the tongue are more sensitive to different tastes • Pupils will be able to understand that the flavour of food dominoes when we have a cold and cannot smell • Pupils will be able to know that sensor (receptor) cells detect stimuli, and effector cells (muscles) produce a response • Pupils will be able to understand the need for simple reflex actions i.e. for protection • Pupils will be able to recall examples of simple reflex action limited to knee jerk, iris, touching a hot surface • Pupils will be able to interpret simple data on reaction times • Pupils will be able to know that the skin contains sensory

	value at any point in a single closed loop • Pupils will be able to know and use the relationship between quantity of charge, current and time • Pupils will be able to know that current depends both resistance and potential difference and the units in which these are measured • Pupils will be able to know and apply the relationship between I, R and V, and that for some resistors the value of R remains constant but that in others it can change as the current changes. • Pupils will be able to explain the design and use of circuits to explore such effects - including for lamps,		nerves for touch, temperature, pain and pressure • Pupils will be able to know that pressure sensors are deeper than pain sensors • Pupils will be able to know that some areas of skin contain more nerve endings than others

	diodes, thermistors and LDRs. • Pupils will be able to describe the difference between series and parallel circuits, explain why, if two resistors are in series, the net resistance is increased, whereas as with two in parallel the net resistance is decreased (qualitative explanation only) • Pupils will be able to calculate the currents, potential differences and resistances in d.c. series circuits, and explain the design and use of such circuits for measurement and testing purposes and negative terminals, and the symbols that represent common circuit elements, including diodes, LDRs		

	and thermistors. • Pupils will be able to know that some appliances use more electricity than others • Pupils will be able to know ways of reducing energy loss from the home • Pupils will be able to interpret data for different energy savings strategies focusing on the choice of energy saving appliances (no recall expected) • Pupils will be able to know that energy can be transferred as heat • Pupils will be able to know that the main uses of heat are generating electricity, heating and cooking • Pupils will be able to know that heat energy flows from a hot to a		

	cooler body • Pupils will be able to know that temperature is measured in degrees C and that heat is measured in J • Pupils will be able to understand that the energy to change the temperature of a body depends on its mass, the material it is made from and the temperature change • Pupils will be able to interpret simple data on heating/cooling experiments • Pupils will be able to recall and use the words melting, boiling, freezing, condensing and evaporating • Pupils will be able to use the particle model to define density and explain the differences in density between the		

	different states of matter in terms of the arrangements of the atoms or molecules • Pupils will be able to describe how, wen substances melt, freeze, evaporate, condense or sublimate, mass remains the same, but that these physical changes recover its original properties if the change is reversed. • Pupils will be able to describe what happens during a change of state in terms of internal energy, energy transfers and particle motions • Pupils will be able to know that a solar furnace uses radiation from the sun focussed by a curved mirror • Pupils will be able to understand that when		

	light is absorbed by a material the energy of the material increases and it becomes hotter • Pupils will be able to know that a solar furnace is used for heating water which can be used for cooking or electricity generation • Pupils will be able to know that hot air rises and is replaced by colder air • Pupils will be able to know that metals are good conductors of heat and that trapped air and plastics are good insulators • Pupils will be able to understand the terms insulator and conductor • Pupils will be able to know that insulation reduces heat loss • Pupils will be able to be able to design and		

	carry out a test to evaluate the effectiveness of takeaway food packaging • Pupils will be able to calculate energy efficiency for any energy transfer, and describe ways to increase efficiency • Pupils will be able to interpret simple data on home insulation		

Cycle Three			
Autumn 1		**Autumn 2**	
Dead or Alive ELB1; Gasping for Breath ELB5 **Unit Award:** 115339 BIOLOGY (UNIT 1): CHARACTERISTICS OF LIFE		**Practical Task; You only Have one Life ELB7** **Unit Award:** PSE026 HEALTHY LIFESTYLES	
Encountering	**Developing**	**Encountering**	**Developing**

• Pupils will be able to sort items into groups of 'living', 'dead' and 'never a live'. • Pupils will know the name of the main external parts of the human body. • Pupils will be able to name the five senses. • Pupils will be able to use a microscope. • Pupils will be able to look at their own cheek cells under a microscope.	• Pupils will be able to recall the life processes, movement, respiration, sensitivity, growth, reproduction, exertion and nutrition • Pupils will be able to name the body systems involved with these life processes: circulatory, respiratory and digestive • Pupils will be able to label the nucleus, cytoplasm and cell membrane of an animal cell • Pupils will be able to know that the nucleus controls the cell; the membrane allows some chemicals to pass in and out, and the cytoplasm is where useful chemical reactions take place • Pupils will be able to know that cells get	• Pupils will be able to identify three things needed for a healthy body. • Pupils will be able to identify two ways in which they can protect their body from the sun. • Pupils will be able to recognise from pictures, three healthcare services. • Pupils will be able to identify a health centre in the local community.	• Pupils will be able to know that being overweight or underweight is linked to increased health risks • Pupils will be able to understand that regular exercise is important for a healthy lifestyle • Pupils will be able to know that regular exercise reduces the risk of heart disease • Pupils will be able to know that different people have different lifestyles and therefore dietary requirements • Pupils will be able to understand in simple terms the process of digestion and absorption and where these events occur • Pupils will be able to know that enzymes speed up reactions in human • Pupils will be able to understand that enzymes speed up digestion to produce smaller soluble

	substances in by diffusion, and active transport • Pupils will be able to know that new cells are made when cells divide • Pupils will be able to know that new body cells are needed for growth and repair • Pupils will be able to know that cancer can be cause when cell division is out of control • Pupils will be able to know that bigger organisms have cells that are adapted for different roles to include nerve cells/root hair cells/red blood cells • Pupils will be able to know that stem cells are cells that can change into other cells		chemicals (which can pass into the blood by diffusion) • Pupils will be able to know that there are different enzymes in the mouth, stomach and intestines, each of which digests a different type of food. • Pupils will be able to know that drugs can be beneficial or harmful • Pupils will be able to know that a drug is a chemical that has an effect on the mind or the body • Pupils will be able to know that some drugs are addictive • Pupils will be able to know how the effect of caffeine on heart rate can be measured • Pupils will be able to know that alcohol abuse accounts for more deaths and crime than any other drug • Pupils will be able to know the short term effects of alcohol (limited to blurred

	• Pupils will be able to know that stem cells can be used in medicine to repair the body • Pupils will be able to name and locate the windpipe, lungs and ribs on a diagram of the thorax • Pupils will be able to understand that lung volumes vary and may be affected by smoking • Pupils will be able to know that smoking can cause heart disease and cancer • Pupils will be able to recall that tobacco smoke contains carbon monoxide, nicotine, tars and solid particles • Pupils will be able to know that carbon monoxide is odourless, colourless and		vision, slurred speech, poor balance and slower reactions) • Pupils will be able to know the dangers of drink driving • Pupils will be able to know the long term effects of alcohol

	poisonous • Pupils will be able to know that nicotine is addictive and that nicotine patches can be used to help someone giving up smoking • Pupils will be able to interpret data relating to heath studies on smoking • Pupils will be able to know that other people may be affected by passive smoking • Pupils will be able to know that in all cells, glucose from food and oxygen breathed in combine to release energy and that this process is called respiration • Pupils will be able to know that carbon dioxide and water are the waste products of		

	respiration • Pupils will be able to recall how to test breath for carbon dioxide using limewater, and for water vapour with a mirror or cobalt chloride paper • Pupils will be able to know that carbon dioxide is removed from our bodies via the lungs • Pupils will be able to know that durting exercise, more oxygen and glucose is needed by muscles and water and carbon dioxide are removed more quickly		
Spring 1		**Spring 2**	
Physical or Chemical Change ELC1; Acids and Alkalis ELC2 **Unit Award:** 87654: INTRODUCTION TO CHEMISTRY		**Pushes and Pulls ELP9; Practical Task** **Unit Award:** 1118654 INVESTIGATING FORCES	

Encountering	Developing	Encountering	Developing
• Pupils will be able to feel ice and warm water either on their hands and feet and be able to label them hot and cold. • Pupils will be able to feel warmth through a hot water bottle. • Pupils will be able to watch the movement of food colouring through water. • Pupils will be able to observe the effects of experiments to show heating and cooling. • Pupils will be able to experience feeling a range of balls with a range of textures and communicate how they feel. • Pupils will be able to explore a range of mixtures by using all the senses.	• Pupils will be able to explain states of matter using the particle model • Pupils will be able to explain changes of state using the particle model • Pupils will be able to describe the physical states of products and reactants using state symbols • Pupils will be able to plan an experiment to work out the melting point of a solid • Pupils will be able to use data to predict states of substances under given conditions • Pupils will be able to explain chemical reactions using the particle model • Pupils will be able to	• Pupils will be able to recognise five forces in everyday situations. • Pupils will be able to make a parachute. • Pupils will be able to investigate the frictional effects on four different surfaces. • Pupils will be able to explore how the changing height of a ramp affects the distance travelled by a car. • Pupils will be able to explore how the size of a parachute affects the rate of fall. • Pupils will have explored different materials that	• Pupils will be able to know that forces can be pulls, pushes, twists or bends • Pupils will be able to know that forces are measured in Newtons • Pupils will be able to understand that unbalanced forces change the motion of an object • Pupils will be able to know that gravity is a force pulling things towards the Earth • Pupils will be able to understand that weight is due to the force of gravity • Pupils will be able to know that an objects gravitational potential energy is composed of its mass, height and gravity • Pupils will be able to know that falling objects are acted on by gravity and drag • Pupils will be able to understand the effect of air

	use ideas about the behaviour of particles and bonds to explain what happens during of state • Pupils will be able to know that during a change of state the mass of the substance remains the same • Pupils will be able to explain using the particle model why in a non-enclosed reaction there may be loss of mass during a chemical reaction limited to one of the products being a gas • Pupils will be able to know that some reaction may be reversed e.g. forward reaction and backwards • Pupils will be able to label simple laboratory apparatus used to	might prevent an egg from cracking.	resistance on falling objects • Pupils will be able to know that falling objects can reach a maximum speed • Pupils will be able to know that a stretched elastic band exerts a force • Pupils will be able to know that an increased force increases the length of an elastic material • Pupils will be able to give a simple description of the relationship between force and extension in stretching a spring • Pupils will be able to know that the extension of an elastic material is proportional to the force applied to it • Pupils will be able to know that elastic materials return to their original shape unless the force becomes too big • Pupils will be able to apply the relationship between work done = force x distance

	obtain a dye from a plant (limited to beaker, stirring rod, heating apparatus, filter funnel, filter paper and mortar and pestle) • Pupils will be able to know that the colour of some dyes can be changed by adding acids and alkalis • Pupils will be able to understand safety precautions when using acids or alkalis • Pupils will be able to interpret simple information about the use of indicators to classify solutions as acid, neutral or alkali • Pupils will be able to know how to use the pH scale • Pupils will be able to know that pH can be measured		moved

	electronically • Pupils will be able to know that neutralisation occurs when acids and alkalis are mixed • Pupils will be able to know that acids procure protons and alkalis produce hydroxide ions • Pupils will be able to understand the uses of neutralisation, limited to curing indigestion and reducing the acidity of soils • Pupils will be able to know that excess acid in the stomach is a cause of indigestion • Pupils will be able to interpret simple information comparing the effectiveness of different indigestion remedies (no recall expected)		

Summer 1		Summer 2	
Driving Along ELP10; Casualty- The Heart ELB6 **Unit Award:** 115419 SKILLS FOR LIFE (UNIT 2)		**Everything in its Place ELC3; Heavy Metal ELC8** **Unit Award:** 115344 CHEMISTRY (UNIT 2): MATERIALS AND THEIR USES	
Encountering	**Developing**	**Encountering**	**Developing**
• Pupils will be able to identify the changes that take place in puberty for boys and girls. • Pupils will know that exercise is important for a healthy body. • Pupils will know that a healthy diet is important for a healthy body. • Pupils will be able to name two things they do to keep themselves and others safe when handling food. • Pupils will know how to store food correctly in a fridge.	• Pupils will be able to recall and able to use speed =distance / time • Pupils will be able to understand that speed limits were introduced to save fuel and improve road safety • Pupils will be able to know that the national speed limit if 60mph on most roads, 70mph on motorways and dual carriageways • Pupils will be able to understand why speed limits are less than the national limits in	• Pupils will be able to classify given materials as 'metal' and 'non-metal'. • Pupils will know some of the properties of wood and its uses. • Pupils will know the main properties of metal and its uses. • Pupils will know the main properties of plastic and its uses. • Pupils will know the main properties of glass and its uses.	• Pupils will be able to know the relative size of atoms and small molecules • Pupils will be able to know that scientists' ideas of what an atom looks like has changed over time • Pupils will be able to describe the atom as a nucleus surrounded by particles called electrons • Pupils will be able to recall relative charges and approximate relative masses of protons, neutrons and electrons • Pupils will be able to explain how the position of an

• Pupils will know some basic first aid. • Pupils will know how and when to contact the emergency services.]Pupils will know how to stay safe in the home. • Pupils will be able to recognise the change in heart rate after exercise. • Pupils will be able to prepare a healthy snack. • Pupils will be able to use food hygiene techniques in a kitchen. • Pupils will be able to identify an item in a first aid kit that might help with treating a cut or graze. • Pupils will be able to perform at least four basic household tasks eg washing up, sweeping up, wiping surfaces and dusting.	towns, outside schools and other areas • Pupils will be able to relate the amounts of energy associated with a moving body (limited to faster speed = more energy) • Pupils will be able to describe with examples where there are energy transfers in a system, that there is no net change to the total energy of a closed system • Pupils will be able to describe with example how in all system changes, energy is dissipated, so that it is stored in less useful ways • Pupils will be able to know that more power is required to stop a fast moving car (during braking energy		element in the periodic table is related to its atomic number. Be able to use the names and symbols of common elements from the periodic table. • Pupils will be able to use the names and symbols of the first 20 elements from the periodic table • Pupils will be able to use the names and symbols of the first groups 1,7 and 0 elements from the periodic table • Pupils will be able to recall the names of the periodic groups • Pupils will be able to know that the elements in group 1, 7 and 0 are clustered together because they all have the same number of electrons in the outer shell • Pupils will be able to recognise that the atomic structure of metals and non-metals related to their

• Pupils will be able to make a hot drink and simple snack.	is converted to heat in the brakes - the faster the speed, the faster the energy needs to be converted to heat) • Pupils will be able to know that thinking distance is the distance travelled between seeing danger and starting to brake • Pupils will be able to explain methods of measuring human reaction times and recall typical results • Pupils will be able to know that braking distance is the distance travelled whilst braking • Pupils will be able to know that stopping distance = thinking distance + braking distance • Pupils will be able to		position in the periodic table • Pupils will be able to explain that isotopes are different forms of the same atom with a different number of neutrons • Pupils will be able to calculate numbers of protons, neutrons and electrons in atoms given their atomic number and mass. • Pupils will be able to describe the properties of metals on the basis of their characteristic physical and chemical properties • Pupils will be able to position carbon in the reactivity series of metals • Pupils will be able to know how some metals can be extracted by heating its ore with carbon • Pupils will be able to know that rusting needs iron, water and oxygen • Pupils will be able to explain

	interpret data form table of thinking, braking and stopping distances • Pupils will be able to explain the dangers caused by large decelerations • Pupils will be able to know that crumple zones in a vehicle reduce the impact force • Pupils will be able to know that air bags and seatbelts reduce impact forces for occupants • Pupils will be able to understand the importance of maintaining the supply of oxygen to the body • Pupils will be able to know that the heart is made of muscle • Pupils will be able to know that the heart		reduction and oxidation in terms of loss or gain of oxygen, identifying if iron is being reduced or oxidised when rusting • Pupils will be able to know that paints are used to decorate or protect surfaces • Pupils will be able to know that salt water speeds up rusting • Pupils will be able to describe similarities and differences between the properties of iron and aluminium • Pupils will be able to know that electrolysis is used to extract some metals from their ores because they are more reactive than carbon • Pupils will be able to know that aluminium is formed at the cathode non-metals are formed at the anode in electrolysis using inert electrodes • Pupils will be able to recall one advantage and one

	pumps to force blood out to the lungs or around the body • Pupils will be able to know that the heart acts as a double pump • Pupils will be able to know that arteries carry blood away from the heart and veins to the heart • Pupils will be able to recognise the difference between an artery and a vein • Pupils will be able to know why the heart muscles need a good blood supply • Pupils will be able to explain how red blood cells and plasma are adapted to their functions in the blood • Pupils will be able to know that energy is needed for muscle contraction		disadvantage of making cars from aluminium • Pupils will be able to interpret simple information about metals used to make cars • Pupils will be able to understand why metals are worth recycling • Pupils will be able to interpret information on the recycling of materials

	• Pupils will be able to understand that during exercise muscles need to be supplied with more oxygen and be able to relate this to an increase in heart rate • Pupils will be able to know the equation for respiration • Pupils will be able to compare the processes of aerobic and anaerobic respiration to include the products of both reactions and their effects • Pupils will be able to interpret simple data on breathing and pulse rate during exercise • Pupils will be able to understand that a cut to a major blood vessel is more serious than a cut to a capillary • Pupils will be able to know that heart		

	disease often happens when arteries supplying the heart with blood become blocked • Pupils will be able to know that the risk of heart disease is increased by some factors including high-fat diet and smoking and understand that these factors increase the risk of heart disease, but will not cause it in everyone		