	KEY STAGE TWO SCIENCE PLAN CYCLE A AND C					
	Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
	LKS2					
	Skeleton and movement	**Electricity**	**Health and nutrition**	**Teeth and digestion**	**sound**	**Living things and habitats- classification**
Objectives	1. identify that humans and some other animals have skeletons and muscles for support, protection and movement	1. identify common appliances that run on electricity 2. construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers 3. 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 4. recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit 5. recognise some common conductors and insulators, and associate metals with being good conductors	1. 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	1. describe the simple functions of the basic parts of the digestive system in humans 2. identify the different types of teeth in humans and their simple functions 3. construct and interpret a variety of food chains, identifying producers, predators and prey	1. identify how sounds are made, associating some of them with something vibrating 2. recognise that vibrations from sounds travel through a medium to the ear 3. find patterns between the pitch of a sound and features of the object that produced it 4. find patterns between the volume of a sound and the strength of the vibrations that produced it 5. recognise that sounds get fainter as the distance from the sound source increases	1. recognise that living things can be grouped in a variety of ways 2. explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment 3. recognise that environments can change and that this can sometimes pose dangers to living things
Scientific understanding	Humans and some other animals have skeletons and muscles which help them move and provide protection and support	Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit the component will not work. A switch can be added to the circuit to turn the component on and off. Metals are good conductors so they can be used as wires in a circuit. Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity	Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients that are needed by the body to stay healthy – carbohydrates including sugars, protein, vitamins, minerals, fibre, fat, sugars, water. A piece of food will often provide a range of nutrients.	Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added. The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet. Humans have four types of teeth - incisors for cutting, canines for tearing, molars and premolars for grinding (chewing). Living things can be classified as producers, predators and prey according to their place in the food chain.	A sound source produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound. The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively. Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.	Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things. Living things live in a habitat which provides an environment to which they are suited (year 2 learning). These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way i.e. positive human impact, such as setting up nature reserves or in a bad way i.e. negative human impact, such as littering. These environments also change with the seasons; different living things can be found in a habitat at different times of the year

Enquiry	Use secondary sources to research the parts and functions of the skeleton Compare, contrast and classify skeletons of different animals	Construct a range of circuits Explore which materials can be used instead of wires to make a circuit Classify the materials that were suitable/not suitable for wires Explore how to connect a range of different switches and investigate how they function in different ways Choose switches to add to circuits to solve particular problems such as a pressure switch for a burglar alarm Apply their knowledge of conductors and insulators to design and make different types of switch Make circuits that can be controlled as part of a D&T project	Classify food in a range of ways Use food labels to explore the nutritional content of a range of food items Use secondary sources to find out they types of food that contain the different nutrients Use food labels to answer enquiry questions e.g. How much fat do different types of pizza contain? How much sugar is in soft drinks? Plan a daily diet contain a good balance of nutrients Explore the nutrients contained in fast food	Research the function of the parts of the digestive system Create a model of the digestive system using household objects Explore eating different types of food, to identify which teeth are being used for cutting, tearing and grinding (chewing) Classify animals as herbivores, carnivores or omnivores according to the type of teeth they have in their skulls Use food chains to identify producers, predators and prey within a habitat Use secondary sources to identify animals in a habitat and find out what they eat	Classify sound sources Explore making sounds with a range of objects such as musical instruments and other household objects Explore how string telephones or ear gongs work Explore using objects that change in feature to change pitch and volume such as length of guitar string, bottles of water or tuning forks Measure sounds over different distances Measure sounds through different insulation materials	Observe plants and animals in different habitats throughout the year Compare and contrast the living things observed Use classification keys to name unknown living things Classify living things found in different habitats based on their features Create a simple identification key based on observable features Use fieldwork to explore human impact on the local environment e.g. litter, tree planting Use secondary sources to find out about how environments may naturally change Use secondary sources to find out about human impact, both positive and negative, on environments
Investigation	Investigate pattern seeking questions such as • Can people with longer legs run faster? • Can people with bigger hands catch a ball better?	Are all metals conductors of electricity? Does an additional battery change the brightness of a bulb?	Drink investigation. Which drinks contain the most sugar?	Impact of sugar on teeth- egg shell investigation.	Which material is the best for insulating sound? (earphones)	
Key vocabulary	Skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints.	Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water.	Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain	Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate

	KEY STAGE TWO SCIENCE PLAN CYCLE A AND C					
	UKS2					
	The circulatory system	**Electricity**	**Keeping healthy**	**Evolution**	**Light**	**Classification**
Objectives	1. identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood 2. recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function 3. describe the ways in which nutrients and water are transported within animals, including humans	1. associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit 2. 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 3. use recognised symbols when representing a simple circuit in a diagram	1. 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 2. to recognise the impact of drugs on the body.	1. recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago 2. recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents 3. identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	1. recognise that light appears to travel in straight lines 2. 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 3. 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 4. use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	1. 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 2. give reasons for classifying plants and animals based on specific characteristics
Scientific understanding	The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well out heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g. lack of vitamins.	Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. If you use a battery with a higher voltage, the same thing happens. Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well. You can use recognised circuit symbols to draw simple circuit diagrams.	Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients that are needed by the body to stay healthy – carbohydrates including sugars, protein, vitamins, minerals, fibre, fat, sugars, water. A piece of food will often provide a range of nutrients. Discuss the positive and negative use of drugs on the body.	All living things have offspring of the same kind, as features in the offspring are inherited from the parents. Due to sexual reproduction, the offspring are not identical to their parents and vary from each other. Plants and animals have characteristics that make them suited (adapted) to their environment. If the environment changes rapidly some variations of a species may not suit the new environment and will die. If the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. Over time these inherited characteristics become more dominant within the population. Over a very long period of time these characteristics may be so different to how they were originally that a new species is created. This is evolution. Fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the theory of evolution. More recently scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics.	Light appears to travel in straight lines and we see objects when light from them goes into our eyes. The light may come directly from light sources but for other objects some light must be reflected from the object into our eyes for the object to be seen. Objects that block light (are not fully transparent) will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object.	Living things can be formally grouped according to characteristics. Plants and animals are two main groups but there are other livings things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms. Plants can make their own food whereas animals cannot. Animals can be divided into two main groups – those that have backbones (vertebrates) and those that do not (invertebrates). Vertebrates can be divided into five small groups – fish, amphibians, reptiles, birds and mammals. Each group has common characteristics. Invertebrates can be divided into a number of groups including insects, spiders, snails and worms. Plants can be divided broadly into two main groups – flowering plants and non-flowering plants.

Enquiry	Create a role play model for the circulatory system Carry out a range of pulse rate investigations • Pattern seeking – exploring which groups of people may have higher or lower resting pulse rates • Observation over time - how long does it take my pulse rate to return to my resting pulse rate (recovery rate) • Pattern seeking – exploring recovery rate for different groups of people Learn about the impact of exercise, diet, drugs and lifestyle on the body. This is likely to be taught through direct instruction due to its sensitive nature	Explain how a circuit operates to achieve particular operations, such as control the light for a torch with different brightnesses or make a motor go faster or slower Make circuits to solve particular problems such as a quiet and a loud burglar alarm Make circuits that can be controlled as part of a D&T project	Classify food in a range of ways Use food labels to explore the nutritional content of a range of food items Use secondary sources to find out they types of food that contain the different nutrients Use food labels to answer enquiry questions e.g. How much fat do different types of pizza contain? How much sugar is in soft drinks? Plan a daily diet contain a good balance of nutrients Explore the nutrients contained in fast food	Design a new plant or animal to live in a particular habitat Use models to demonstrate evolution e.g. Darwin's finches bird beak activity Use secondary sources to find out about how the population of peppered moths changed during the industrial revolution Make observations of fossils to identify living things that lived on Earth millions of years ago Identify features in animals and plants that are passed on to offspring Explore this process by considering the artificial breeding of animals or plants e.g. dogs Compare the ideas of Charles Darwin and Alfred Wallace on evolution Research the work of Mary Anning and how this provided evidence of evolution	Explore different ways to demonstrate that light travels in straight lines e.g. shining a torch down a bent and straight hose pipe, shining a torch through different shaped holes in card Explore the uses of the behaviour of light, reflection and shadows such as in periscope design, rear view mirrors and shadow puppets.	Use secondary sources to learn about the formal classification system devised by Carl Linnaeus and why it is important Use first hand observation to identify characteristics shared by the animals in a group Use secondary sources to research the characteristics of animals that belong to a group Use information about the characteristics of an unknown animal or plant to assign it to a group Classify plants and animals presenting this in a range of ways – Venn diagrams, Carroll diagrams and keys Create an imaginary animal which has features from one or more groups.
Investigation	Fair test – effect of different activities on my pulse rate	Carry out fair tests exploring changes in circuits. Adding additional power, adding additional lights, buzzers etc	Drink investigation. Which drinks contain the most sugar?	Eye colour investigation- Is eye colour hereditary?	Periscope investigation.	Investigation into plants found in the local area. Add findings to classification keys- size of leaves, number of flowers etc.
Key vocabulary	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs and lifestyle	Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage NB Children do not need to understand what voltage is but will use volts and voltage to describe different batteries. The words cells and batteries are now used interchangeably	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, drugs, medicine.	Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, light rays, straight lines.	Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non-flowering