

Science Knowledge progression						
Culture Capital British Values KPI						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	<p>Understand that we hear with our ears. Explore the environment listening to sounds</p> <p>Make observations indoors and outdoors in Nursery.</p> <p>Make collections of natural materials to investigate and talk about.</p> <p>Know that some snacks and foods help us to grow such as milk.</p> <p>Name animals you would find on a farm (horse, pig, cow, chicken, goat) and learn the name for its young.</p> <p>Name animals you would see in the school grounds. (guinea pigs, dogs, fish, frogs, squirrels, wood pigeons)</p> <p>Sort and match photographs and pictures e.g. sort into flowers or trees, or sort into living and not living.</p>	<p>Use their senses: hands on exploration of natural materials and objects linked to celebrations and <b>festivals, different materials used in baubles on Christmas trees, the feel of candles for a Hannukah and birthday.</b></p> <p>Know that candles melt when they burn</p> <p>Explore collections of materials with similar and/or different properties.</p> <p>Talk about what they see.</p> <p>Make collections of man-made materials to investigate and talk about.</p> <p>Provide magnifying glasses or a tablet with a magnifying app.</p> <p>Model observational and investigational skills. Ask out loud: “I wonder if...?”</p> <p>Plan and introduce new vocabulary, encouraging children to use it to discuss their findings and ideas. <b>Light</b></p> <p>Know what happens when we turn a light source off. Compare the brightness of light sources.</p> <p>Know and explore how you can shine light through some materials, but not others.</p> <p><b>Electricity</b></p> <p>To know some devices are plugged into power sockets and some use batteries.</p> <p>To know we can switch off devices to save energy and money.</p>	<p>Provide children with opportunities to change materials from one state to another.</p> <p>Cooking – combining different ingredients, and then cooling or heating (cooking) them.</p> <p>Chinese New Year noodles, pancakes.</p> <p>Freezing – know that water freezes to become ice and that freezing is cooling something down.</p> <p>Melting – know that melting is warming somethings up. Know that melting is when something changes from a solid to a liquid. Leave ice cubes out.</p> <p>Know that we put on hats, scarves and gloves to keep our body heat in.</p> <p>Know why and investigate why some materials are good e.g. why wellies are good in puddles and the rain; why some coats are good in the rain; why some materials are good for umbrellas.</p> <p>Create a simple weather chart.</p> <p>Understand the terms rain, snow, wind, sun.</p>	<p>Explore how different materials sink and float.</p> <p>Plant seeds and care for growing plants.</p> <p>Know that plants need water and light to survive.</p> <p>Understand the key features of the life cycle of a plant (sunflower seed) and an animal (caterpillar and chicks). To know plants grow, shoot grow) , die. Animal – birth, grow, change, die. Egg</p> <p>Begin to understand the need to respect and care for the natural environment and all living things.</p> <p>Show and explain the concepts of growth, change and decay with natural materials.</p> <p>Encourage children to refer to books, wall displays and online resources. This will support their investigations and extend their knowledge and ways of thinking</p>	<p>Invite different people to visit from a range of occupations, <b>a farmer , a vet, a dental nurse, a member of the emergency services or an author.</b></p> <p>Plan and introduce new vocabulary related to the occupation, and encourage children to use it in their speech and play.</p> <p>Understand the features of their bodies. Learn the terms: head, stomach, arms, legs, toes, fingers and feet, teeth.</p> <p>Know how to look after their own health and hygiene including teeth.</p> <p>Know to wash hands after visiting the toilet.</p> <p>Understand that people grow over time.</p> <p>Know the terms : hurts, aches, throbs, cut, graze.</p> <p>Know that doctors and nurses need to sometimes look at parts of us to find what might be wrong e.g. ears, eyes, fingers.</p>	<p><b>Forces</b></p> <p>Draw children’s attention to forces.</p> <p>Know:</p> <ul style="list-style-type: none"> <li>- how the water pushes up when they try to push a plastic boat, balloon, table tennis ball under it</li> <li>- how they can stretch elastic, snap a twig, but can’t bend a metal rod</li> <li>- explore springs of different sizes</li> <li>- magnetic attraction and repulsion</li> <li>- what happens to their bikes and scooters on different surfaces and ramps.</li> </ul> <p>Understand the safety linked to the sun: not to look directly at the sun; applying sun cream; wearing hats; drinking water.</p> <p>Understand safety linked to water e.g. sea, rivers, canals etc.</p> <p>Know how to respond when they feel hot or cold.</p> <p>Know the difference between day and night in relation to the movement of the sun. Understand the idea of sunrise and sunset.</p> <p>Learn that there is more daylight in the UK in the summer than in winter.</p> <p>Investigate shadows.</p> <p>Look, and talk about, how the environment changes in the summer in particular: trees, plants, grass, flowers.</p>
Vocabulary	<p>Animal: horse, pig, cow, chicken, goat, guinea pigs, dogs, fish, frogs, squirrels, bird - wood pigeon,</p> <p>Fur, feathers, scale, tail, wings, beak, claws, paws, hooves, swim, fly, walk.</p> <p>ears, hear, sound, listen, indoor, outdoor, natural,</p> <p>Leaves, twigs, bark, feathers, pebbles, same, different, pattern</p>	<p>Natural, man-made, plastic, fabric, paper, wood, magnifying glass, rough, smooth, hard, soft, wax, candle, heat, burn, melt</p> <p>Light, torch, bulb, shiny, bright, brighter, brightest, Sun, shine, glow, mirror,</p> <p>Battery, plug, socket, electricity, wire, sound, light,</p>	<p>Pine cone, mix, stir, cook, hot, oven, microwave, change, burn, melt, hard, runny, set, freeze, freezer, cold, blended, hard, soft, bendy, stiff, wobbly, wood, plastic, paper, card, fabric, solid, liquid, stronger, weaker</p>	<p>Plant, leaf, stem, trunk, branch, root, bark, flower, petal, seed, berry, fruit, vegetable, bulb, plant, hole, dig, water, weed, grow, shoot, die, dead, soil</p> <p>Seedling, healthy, unhealthy, strong, Egg, chick, bird, cocoon, caterpillar, butterfly, grow, change, die,</p>	<p>graze, head, stomach, arms, legs, toes, fingers and feet, teeth, hurt, ache, throbs, cut, germs,</p> <p>grow, change, baby, toddler, child, adult, old person,</p>	<p>Object, float, sink, water, up, down, bottom, push, pull, magnet, spring, squash, bend, twist, stretch, turn, spin, smooth, rough, fast, flow.</p>
Trips/Visitors					Vets, Nurse. Fire brigade, Dental nurse	Chorlton Water Park – link with RE topic
Key Texts				The Tiny Seed , The Hungry Caterpillar	Michael Recycle	
Reception	<p>Know some of the parts of the body – head, shoulder, knee, toe, foot, leg, arm, hand, hair, eye, nose, mouth. Use colour to describe hair, skin and eye colour – see vocabulary.</p> <p>Know who is in their immediate family and name and describe people who are familiar to them.</p> <p>Know how they are similar or different to their friends and family.</p> <p>Know that autumn follows summer.</p> <p>Take a picture of a tree in the GIFT garden each week to build up a port folio of the changing seasons.</p> <p>Know some of the changes happening moving from summer to autumn –</p>	<p>Know the effect of changing seasons on some animals and plants</p> <p>Know what nocturnal means and name some animals that are nocturnal fox, badger, owl.</p> <p>Know that some animals hibernate during the winter – hedgehogs, squirrels.</p> <p>Know that winter follows autumn.</p> <p>Know some of the differences between autumn and winter – shorter days, colder, leaves have fallen from the trees.</p>	<p>Opportunity to explore the natural world and the changing seasons</p> <p>Know water freezes to become ice.</p> <p>Know that putting ice cubes in different areas of the playground can change how quickly they melt.</p> <p>Know water melts and becomes water again. Know that a large block of ice changes over time, use string to measure it.</p> <p>Know that heat helps this process.</p> <p>Know that heating things can change them – make fruit cupcakes - DT</p>	<p>Know some of the changes moving from winter to spring. Know leaves start to grow on trees.</p> <p>Know and observe the life cycle of a frog - frog spawn, tadpole, frog.</p> <p>Know that chickens hatch from eggs.</p> <p>Know chicks are birds and that they have beaks, feathers and wings.</p> <p>Know and explore that puddles change over time after it rains.</p> <p>Know that a life cycle is ongoing.</p>	<p>Know a habitat is where something lives.</p> <p>Know the names of some habitats: pond, woodland, desert, rainforest</p> <p>Know and explore different habitats in the local environment: pond, woodland.</p> <p>Know frogs live in ponds and on land.</p> <p>Explore the natural world around them by finding minibeasts in the school grounds. Ladybirds, woodlouse, worms, rosemary beetles, ants, spiders.</p> <p>Name and describe plants and animals they find in the school grounds – lavender, rosemary, poppies, holly.</p> <p>Some plants (herbs) have a strong smell – lavender, basil, mint and rosemary.</p>	<p>Know that summer follows spring and know the changes – warmer and the way the plants flourish.</p> <p>Identify the similarities and differences between plants and animals they find in the GIFT garden and those of a beach, seashore.</p> <p>Know that some objects float and some objects sink.</p> <p>Know how wheels turn when sand or water is poured through them.</p> <p>Know how toy cars move down ramps and gutters.</p>

	leaves changing colour and some falling to the ground, getting colder, wetter, conkers an acorns in the ground. Know that acorns and conkers are the seeds of a tree.				Know we have our noses to smell and tongues to taste.	
Vocabulary	hair (black, brown, dark, light, blonde, ginger, grey, white, long, short, straight, curly), eyes (blue, brown, green, grey), skin (black, brown, white), big/tall, small/short, bigger/smaller, baby, toddler, child, adult, old person, old, young, brother, sister, mother, father, aunt, uncle, grandmother, grandfather, cousin, friend, family, boy, girl, man, woman, bald, elderly, wrinkles, male, female, freckles, summer, autumn, seasons, plants, flowers, change, conkers, acorns,	Hibernate, autumn, winter, nocturnal, fox, badger, owl, hedgehogs, squirrels,	Ice, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big, bigger, biggest, smaller, smaller, smallest, hard, soft, bendy, rigid, wood,	Frog spawn, tadpole, frog, beak, feathers, wings, winter, spring, chicks, egg,	Ladybirds, woodlouse, worms, rosemary beetles, ants, spiders. Name and describe plants and animals they find in the school grounds – lavender, rosemary, poppies, holly.	Float, sink, up down, top, bottom, surface, move, roll, fly, fall, fast, slow, faster, slower, fastest, slowest, further, furthest,
Trips/Visitors					Chorlton Water Park Mersey Valley Warden	Coastal visit
Key Texts					Greta and the Giants , Poo at the zoo	
EY ELG The Natural World Understanding the world	Children at the expected level of development will: - Explore the natural world around them, making observations and drawing pictures of animals and plants; - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.					
Year 1	<b>EVERYDAY MATERIALS</b> 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. Compare and group together a variety of everyday materials on the basis of their simple physical properties.  Know all objects are made of one or more materials. Some objects can be made from different materials - plastic, metal or wooden spoons. Know that materials can be described by their properties Know that materials can be hard, soft, strong, weak, absorbent, heavy, light, solid and runny, smooth and rough; these descriptions denote the properties of a material. Know some materials e.g. plastic can be in different forms with very different properties.  <b>Working scientifically:</b> Key investigation: sorting and classifying materials, pattern seeking- are all _____ made from the same material? Fair test: what is the best material for..... observation over time- ice	<b>ANIMALS including humans</b> Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.  Know humans have key parts in common, but these vary from person to person. Know wrist, elbow, knee, thigh, ankle, cheek, chin Humans (and other animals) find out about the world using their senses. Humans have five senses – sight, touch, taste, hearing and smelling. Know eyes/sight, ears/hearing, tongue/tasting, nose/smelling, skin/touch.  <b>Working Scientifically:</b> Key investigation: Are we all the same or are we all different? Chdn discover what is the same and what is different about their bodies. Noticing patterns.	<b>ANIMALS including humans</b> 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).  Know that salmon, tuna are examples of fish; a frog is an example of an amphibian; a lizard is an example of a reptile; a robin is an example of a bird; a rabbit and a human are examples of a mammal and explore further examples of each animal type Know that herbivorous animals eat plants; carnivorous animals eat other animals; omnivorous animals eat both animals and plants Know that a cat is an example of a carnivore; that a rabbit is an example of a herbivore; know that many humans are examples of omnivores (though not vegetarians) Know that fish, amphibians, reptiles, birds and mammals are similar in that they have internal skeletons and organs; these are known as vertebrates, which means they are animals that have a backbone. Know that fish are different to other animals in having gills so that they can breathe underwater and scaly skin	<b>PLANTS</b> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.  Growing locally, there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants. Know some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring - deciduous. Know a rose bush, a sunflower, lavender, poppy, cornflower and a dandelion by sight Know an oak tree, a birch tree and a horse chestnut tree by sight Know that evergreen trees maintain their leaves throughout the year – find holly and laurel in the Gift Garden. and that deciduous trees shed their leaves in autumn – identify beech and sycamore in the Gift garden. Know that a flowering plant consist of roots, stem, leaves and flowers, and that a tree’s stem is called a trunk  <b>Working scientifically</b> Key investigation: sorting and classifying plants and trees	<b>EVERYDAY MATERIALS</b> Know and describe a range of properties and know that materials can have more than one property: rough smooth, water absorbent, waterproof, hard, soft, squashy. Know these properties can determine if it would be a good material to make an object out of eg comparing different uses of paper – tissue, paper towel, writing paper. What should the lining of a dog basket be made from? What should we use to make an umbrella from? Begin to introduce transparent and opaque  <b>Working scientifically:</b> Key investigation: sorting and classifying materials, pattern seeking- are all _____ made from the same material? Fair test: what is the best material for..... observation over time- ice	<b>OVER THE YEAR:</b> <b>SEASONAL CHANGES</b> Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.  Know that days are longer in the summer and shorter in winter, In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again. Know that weather changes through the year, getting hotter in the summer and colder in the winter. Know that the four seasons are spring, summer, autumn and winter and know the order of the cycle The weather also changes with the seasons. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people. Know that the winter is likely to bring ice on the ground when water freezes due to the cold.  <b>Working Scientifically:</b> Key investigation: observation over time- how do the seasons change our environment, pattern seeking- do all trees look the same in spring? Is the weather the same every day?

			<p>Know that amphibians are different to other animals in that they begin their lives with gills but then develop lungs and breathe on land</p> <p>Know that reptiles are different to other animals in that they breathe air and have scaly skin and lay eggs.</p> <p>Know that birds are different to other animals in that they have feathers and wings and they lay eggs.</p> <p>Know that mammals are different to other animals in that they have fur/hair and they feed milk to their young</p> <p><b>Working Scientifically:</b></p> <p>Key investigation: sorting and classifying on observable features, pattern seeking with all fish/amphibian types.</p>			Chn keep a weather diary across a period of time and compare this to a pre-made one for a different period of the year, drawing conclusions.
Vocabulary	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through	Sight, sound, smell, taste, touch, associated body parts, wrist, elbow, knee, thigh, ankle, cheek, chin.	tail, wing, claw, fin, scales, feathers, hair, feathers, fur, beak, paws, hooves, birds, fish, animals, plants	Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, holly, silver birch, evergreen.		Weather: sunny, rainy, windy, snowy Seasons: winter, summer, spring, autumn Sun, sunrise, sunset, day length. Dawn, dusk, evening
Key Texts			I Build A Home			
Trips Visitors				Local area: Merseybank playing fields/Kenworthy woods, CWP		Local area: Kenworthy woods/ Merseybank estate/Gift garden
Year 2	<p><b>USES of EVERYDAY MATERIALS</b></p> <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p>Know all objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water.</p> <p>Know when choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities.</p> <p>Know a material can be suitable for different purposes and an object can be made of different materials.</p> <p>Know objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc.</p> <p>Know this can be a property of the material or depend on how the material has been processed e.g. thickness</p> <p><b>Link to history and the work of Isambard Kingdom Brunel</b></p>	<p><b>ANIMALS including HUMANS</b></p> <p>Notice that animals, including humans, have offspring which grow into adults.</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p>Know animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults.</p> <p>Know in other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults.</p> <p>Know the young of some animals do not look like their parents e.g. tadpoles.</p> <p>Know all animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive.</p> <p>Know to grow into healthy adults, they also need the right amounts and types of food, sleep and exercise.</p> <p>Know good hygiene is also important in preventing infections and illnesses: washing hands using tissues and cough and sneeze into their elbow.</p> <p>Know that animals, including humans, need food, water and air to survive</p>	<p><b>LIVING THINGS AND THEIR HABITATS</b></p> <p>Explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>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.</p> <p>Identify and name a variety of plants and animals in their habitats, including micro-habitats.</p> <p>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> <p>Know all objects are either living, dead or have never been alive.</p> <p>Know living things are plants (including seeds) and animals.</p> <p>Know dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair ``and feathers.</p> <p>Know an object made of wood is classed as dead. Objects made of rock, metal and plastic have never been alive.</p> <p>Know animals and plants live in a habitat to which they are suited.</p> <p>Know woodland, pond, ocean, desert and polar habitats.</p> <p>Know there are micro-habitats within a habitat eg bark of the tree, leaf fall in a forest.</p>	<p>Continuation of living things and their habitats 3 weeks.</p> <p>Extension and development of Uses of Everyday Materials</p> <p>Know all objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water.</p> <p>Know when choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities.</p> <p><b>Working scientifically :</b></p> <p>Key investigation: sort and classify types of material, pattern seeking- which material can be changed easily?</p>	<p><b>PLANTS</b></p> <p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p>Know plants may grow from either seeds or bulbs.</p> <p>Know these then germinate and grow into seedlings which then continue to grow into mature plants.</p> <p>Know these mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy.</p> <p><b>Working Scientifically:</b></p> <p>Key investigation: Fair test- what do plants need most? Observation over time- what happens when we plant seeds and bulbs?</p>	

	<p><b>Working scientifically :</b></p> <p>Key investigation: sort and classify types of material, pattern seeking- which material can be changed easily? What materials could be used to make a good raincoat? Chn test whether different materials are waterproof, flexible and light. What materials could be used to make a good bike shed Chn test whether different materials are strong, hard and waterproof</p>	<p>Know the basic food groups: fruit and vegetables, carbohydrates, protein, dairy, fat and sugary foods</p> <p>Know that proteins are good for growth, carbohydrates for energy and fruit and vegetables provide vitamins and minerals which help keep us healthy (e.g. calcium for healthy bones and teeth)</p> <p>Know that more than half of our diet should be made up of carbohydrates, fruit and vegetables (see diagram below)</p> <p>Know that fats and sugary foods should be eaten rarely and in small amounts</p> <p>Know that people need to exercise often to help their body stay strong and fit</p> <p>Know that keeping clean, including washing and brushing teeth, is an important part of staying healthy</p> <p><b>Working scientifically:</b></p> <p>Do all animals start off small?</p> <p>Chn pair up pictures of a variety of animals with their very young and juvenile forms.</p> <p>Pattern seeking.</p> <p>Is all food good for us? Chn look at a variety of food labels (looking at the traffic light nutrition), comparing which are healthy and why. Research from secondary sources.</p>	<p>Know and describe these conditions eg dark, damp, light, dry.</p> <p>Know and name some of the features of animals and plants which make them suited to their habitat eg polar bear, cacti, ducks, sharks.</p> <p>Know that polar bears are an example of an animal adapted to its environment – thick fur for warmth and oily paw pads to ensure that they don't freeze to the ice</p> <p>Know that sharks are another example – smooth skin and streamlined shape for quick swimming; and gills for breathing underwater</p> <p>Know that cacti are an example of a plant adapted to its environment – thick skin keeps a store of water safe; sharp spikes keep animals from stealing the water</p> <p>Know that pine trees are adapted to their environment in that they have thick bark and pine cones to protect against cold winters</p> <p>Know that woodlice live under logs – an example of a microhabitat - as they need somewhere dark and damp so that they do not dry out</p> <p>Know that frogs can live in ponds – an example of a microhabitat - as they water in which to lay their eggs (frogspawn)</p> <p>Know the habitat provides the basic needs of the animals and plants – shelter, food and water.</p> <p>Know the plants and animals in a habitat depend on each other for food and shelter etc.</p> <p>Know the way that animals obtain their food from plants and other animals can be shown in a food chain.</p> <p>Know that light is a form of energy</p> <p>Know that plants absorb energy from the Sun; that this energy is consumed by herbivorous animals; and that carnivorous animals eat other animals</p> <p>Know that the arrows on a food chain show the direction that the energy travels</p> <p><b>Working Scientifically:</b></p> <p>Key investigation: sorting and classifying animals and habitats, living, dead and never alive, food chains/ what they eat, pattern seeking- animals living in habitat x eat x,</p>		
Vocabulary	Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching	Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)	Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed		Bulb, seed, seedling, flower, water, healthy, germinate, grow, flower, berry, fruit
Key Texts					
Trips Visitors			Chorlton Water Park. School grounds		
Year 3	<p><b>FORCES and MAGNETS</b></p> <p>Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p>	<p><b>ROCKS</b></p> <p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p>	<p><b>PLANTS</b></p> <p>Identify and describe the functions of different parts of flowering plants: roots; stem/trunk; leaves; and flowers.</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and</p>	<p><b>ANIMALS including HUMANS</b></p> <p>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>	<p><b>LIGHT</b></p> <p>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.</p>



	<p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>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.</p> <p>Describe magnets as having two poles.</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p> <p>Know a force is a push or a pull.</p> <p>Know that there are different types of contact force: impact forces (when two surfaces collide), frictional forces (when two surfaces are already in contact) and strain forces (when an elastic material is stretched or squashed)</p> <p>Know when an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes.</p> <p>Begin to know this resistance is called friction.</p> <p>Know a magnet attracts magnetic material.</p> <p>Know iron and nickel and other materials containing these, e.g. stainless steel, are magnetic.</p> <p>Know the strongest parts of a magnet are the poles.</p> <p>Know magnets have two poles – a north pole and a south pole.</p> <p>Know if two like poles, e.g. two north poles, are brought together they will push away from each other – repel.</p> <p>Know if two unlike poles, e.g. a north and south, are brought together they will pull together – attract.</p> <p>Know that there is a magnetic field around a magnet which is strongest at each pole</p> <p>Know for some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees.</p> <p>Know some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts.</p> <p><b>Working scientifically:</b></p> <p>Key investigation: sort and classify magnetic v non magnetic, fair test- which surface ramp lets the car move fastest/ slowest? Pattern seeking- what materials are magnetic?</p>	<p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Recognise that soils are made from rocks and organic matter.</p> <p>Know rock is a naturally occurring material.</p> <p>Know rocks can be different shapes and sizes (stones, pebbles, boulders).</p> <p>Know there are different types of rock e.g. sandstone, limestone, slate, talc etc. which have different properties.</p> <p>Know rocks can be hard or soft and they have different sizes of grain or crystal. Know they may absorb water.</p> <p>Know that the Earth has a solid crust made up of tectonic plates with molten rock beneath</p> <p>Know that there are three kinds of rocks: igneous, sedimentary and metamorphic</p> <p>Know that granite and basalt are types of igneous rock and that igneous rocks form from molten rock below the Earth’s crust</p> <p>Know that limestone and sandstone are types of sedimentary rock which form when small, weathered fragments of rock or shell settle and stick together, often in layers</p> <p>Know that marble and slate are types of metamorphic rock which form when rocks in Earth’s crust get squashed and heated in processes such as when tectonic plates press against each other</p> <p>Know soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter).</p> <p>Know the type of rock, size of rock pieces and the amount of organic matter affect the property of the soil.</p> <p>Know some rocks contain fossils. Fossils were formed millions of years ago.</p> <p>Know when plants and animals died, they fell to the seabed.</p> <p>Know they became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.</p> <p>Know fossils can help us learn about what it was like in the past.</p> <p><b>Working scientifically:</b></p> <p>Key investigation: sort and classify rocks, fair test- which soil is best for growing plants in?</p>	<p>room to grow) and how they vary from plant to plant.</p> <p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p>Know many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom.</p> <p>Know the roots absorb water and nutrients from the soil and anchor the plant in place.</p> <p>Know the stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal.</p> <p>Know the leaves use sunlight and water to produce the plant’s food- photosynthesis.</p> <p>Know some plants produce flowers which enable the plant to reproduce.</p> <p>Know pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination).</p> <p>Know this forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways.</p> <p>Know seed dispersal can happen by wind, sea, animals, explosion.</p> <p>Know different plants require different conditions for germination and growth.</p> <p><b>Working Scientifically:</b></p> <p>Key investigation: obs over time- plants growing and changing, different plants e.g. venus fly traps, water transport in white plants with blue water, pattern seeking- what colour flower do bees visit most? Do all plants need exactly the same things?</p> <p>Chn give both a parsley plant and a small cactus minimal water over a two week period and observe the changes (perhaps drawing the result)</p> <p>Observing over time/ Comparative test</p>	<p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p> <p>Know that animals, including humans, have a skeleton made up of solid objects.</p> <p>Know skull, ribcage, spine.</p> <p>Know tricep and bicep.</p> <p>Know that some animals (such as insects) have an exoskeleton – a solid covering on the outside of their body</p> <p>Know that many invertebrates (such as earthworms and slugs) have water held inside by muscles which acts like a skeleton</p> <p>Know that skeletons provide support for muscles and protect the body; for example, the rib cage protects the vital organs in the human body</p> <p>Know that human skeletons are made up of bones and cartilage</p> <p>Know that muscles can only contract, so they must be arranged in pairs in the body so that as one contracts the other loosens</p> <p>Know that animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need.</p> <p>Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients.</p> <p>Know that excess of a food group can cause ill health, such as tooth decay due to excess sugar</p> <p>Know that excess fat from fatty foods such as butter and cheese - and created in the body from excess calories – builds up in the body and can cause obesity</p> <p>Know that excess body fat can lead to heart disease and increases the strain on joints and growing bones</p> <p><b>Working scientifically</b></p> <p>Key investigation: fair test- who can write fastest boys or girls? Pattern seeking- who has longer arms Yr 3 or Yr 1? Sort and classify- nutrition types, animals vs plants compare and contrast.</p>	<p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</p> <p>Find patterns in the way that the size of shadows change.</p> <p>Know that energy comes in different forms and can be neither created nor destroyed, only changed from one form to another.</p> <p>Know that we need light to see things and that darkness is the absence of light</p> <p>Objects are easier to see if there is more light</p> <p>Know that light is reflected when it travels from a light source and then ‘bounces’ off an object.</p> <p>Know that the Moon is not a light source and is merely reflecting light from the Sun.</p> <p>Know that many light sources give off light and heat</p> <p>Know that everything that we can see is either a light source or something that is reflecting light from a light source into our eyes. Some objects, for example, the sun, light bulbs and candles are sources of light.</p> <p>Know the light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light.</p> <p>Know that shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface.</p> <p>Know that as objects move towards a light source, the size of the shadow increases</p> <p>Know how to show the changing of shadow size by drawing a diagram with straight lines representing light</p> <p>Know that Hasan Ibn al-Haytham - sometimes known as Alhazen - was a scientist and mathematician during early Islamic civilisation</p> <p>Know that al-Haytham was the first to explain that we see objects because light reflects from objects into our eyes</p> <p><b>Working scientifically</b></p> <p>Key investigation: sort and classify natural v man made light sources, research using secondary sources- dangers of sun, pattern seeking/obs over time- how do the size of shadows change during the day?</p>
Vocabulary	Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole, friction	Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, wave, mirror, incident ray, image, beam, photons, solid, opaque, transparent, object, source, data logger
Key Texts		The Street Beneath My Feet	It started with a seed		
Trips Visitors					

Year 4	<p><b>LIVING THINGS AND THEIR HABITATS</b></p> <p>Recognise that living things can be grouped in a variety of ways.</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p> <p>Know that animals can be grouped based on their physical characteristics (e.g. vertebrates and invertebrates) and based on their behaviour (e.g. herbivores, carnivores and omnivores)</p> <p>Know that classification keys can be used to identify and name living things.</p> <p>Know how to use a classification key to identify living things.</p> <p>Know that Carl Linnaeus was a famous scientist who studied life and created a system for sorting living things into different groups</p> <p>Know that the concept of species and kingdoms (such as the animal kingdom or the plant kingdom) was his invention, and that all living things are given a name that uses his method of classification</p> <p>Know how to create a classification key to sort plants on the school premises</p> <p>Know that living things are divided into kingdoms: the animal kingdom, plants, fungi, bacteria, and single-celled organisms</p> <p>Know that a species is a group of living things have many similarities that can reproduce together produce offspring</p> <p>Know these environments may change naturally e.g. through flooding, fire, earthquakes etc.</p> <p>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, pollution).</p> <p>Know that many species of living things have already been made extinct as a result of human activity</p> <p>Know that the polar bear is a famous example of climate change endangering the existence of a species; as the climate changes and gets warmer, the sea ice on which polar bears live reduces in amount making it harder for them to survive and reproduce</p> <p>Know how humans affect the environment locally.</p> <p><b>Working scientifically:</b></p> <p>Key investigation: sort and classify living things by animal group, research using secondary sources- dangers humans present to environments</p>	<p><b>ELECTRICITY</b></p> <p>Identify common appliances that run on electricity.</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>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.</p> <p>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> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>Know and identify household devices and appliances run on electricity.</p> <p>Know some plug in to the mains and others run on batteries and identify examples.</p> <p>Know an electrical circuit consists of a cell or battery connected to a component using wires.</p> <p>Know that if there is a break in the circuit, a loose connection or a short circuit, the component will not work.</p> <p>Know the flow of electrons is from negative to positive.</p> <p>Know and identify cell/battery, wire, switch, buzzer, motor, bulb.</p> <p>Know a switch can be added to the circuit to turn the component on and off.</p> <p>Know an electrical conductor allows electricity to pass through it.</p> <p>Know an electrical insulator does not allow electricity to pass through it.</p> <p>Know metals are good conductors so they can be used as wires in a circuit.</p> <p>Know non-metallic solids are insulators except for graphite (pencil lead).</p> <p>Know water, if not completely pure, also conducts electricity and the risks in the home around electrical safety.</p> <p>Key Vocabulary</p> <p><b>Working scientifically :</b></p> <p>Key investigation: sort and classify mains v battery appliances, pattern seeking- where do we find the most electrical sockets in our homes</p> <p>Sorting and classify conductors and insulators- pattern seeking linked to this.</p>	<p><b>STATES OF MATTER</b></p> <p>Compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>Observe that some materials change state when they are heated or cooled, and measure or research the temp at which this happens in degrees Celsius (°C).</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p>Know a solid keeps its shape and has a fixed volume.</p> <p>Know a liquid has a fixed volume but changes in shape to fit the container.</p> <p>Know a liquid can be poured and keeps a level, horizontal surface.</p> <p>Know a gas fills all available space; it has no fixed shape or volume.</p> <p>Know that granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped.</p> <p>Know it is each individual grain demonstrates the properties of a solid.</p> <p>Know melting is a state change from solid to liquid.</p> <p>Know freezing is a state change from liquid to solid.</p> <p>Know the freezing point of water is 0oC.</p> <p>Know boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid.</p> <p>Know water boils when it is heated to 100oC.</p> <p>Know evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid.</p> <p>Know evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy.</p> <p>Know condensation is the change back from a gas to a liquid caused by cooling.</p> <p>Know and explain the different stages of the water cycle: water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle.</p> <p>L1-5, L7-9</p> <p><b>Working Scientifically:</b></p> <p>Key investigation: sort and classify materials, obs over time/fair test- ice shapes and temperatures</p>	<p><b>ANIMALS including HUMANS</b></p> <p>Describe the simple functions of the basic parts of the digestive system in humans.</p> <p>Identify the different types of teeth in humans and their simple functions.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p> <p>Know food enters the body through the mouth and digestion starts when the teeth start to break the food down.</p> <p>Know saliva is added and the tongue rolls the food into a ball.</p> <p>Know the food is swallowed and passes down the oesophagus to the stomach and the food is broken down further by being churned around and other chemicals are added.</p> <p>Know the food then passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body.</p> <p>Know 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.</p> <p>Know humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing) and identify them.</p> <p>Know living things can be classified as producers, predators and prey according to their place in the food chain.</p> <p>Know a food web shows more relationships and the dependence on other foods.</p> <p>Can explain and recognise the impact of one part of the food chain disappearing has on the food web.</p> <p><b>Working scientifically:</b></p> <p>Key investigation: fair test/obs over time: teeth and types of coke, sort and classify animals on basis of producers, predators and prey</p>	<p><b>SOUND</b></p> <p>Identify how sounds are made, associating some of them with something vibrating.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p> <p>Know a sound produces vibrations which travel through a medium from the source to our ears.</p> <p>Know different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter).</p> <p>Know the vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound.</p> <p>Know 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.</p> <p>Know a sound insulator is a material which blocks sound effectively.</p> <p>Know 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.</p> <p><b>Working scientifically</b></p> <p>Key investigation: pattern seeking- does the size of the instrument impact pitch? Fair test- how to we make the quietest sound? Pattern seeking- does age impact hearing? Pattern seeking- distance and volume</p>
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Vocabulary	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate	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.	Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, condensation, precipitation, temperature, water cycle	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	
Key Texts						
Trips Visitors	Biffa recycling. Merseybank Estate			Dentist. Prime VR – journey of a raspberry.		
Year 5	<p><b>PROPERTIES and CHANGES of MATERIALS</b> 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.</p> <p>Know materials have different uses depending on their properties and state (liquid, solid, gas). Know the properties of materials include hardness, transparency, electrical and thermal conductivity and attraction to magnets. Know Marie Curie discovered two new elements and was a Nobel prize winner.</p> <p><b>Working scientifically:</b> Key investigations: plan and carry out comparative and fair tests to answer questions about how and why certain materials are selected and used because of their properties.</p>	<p><b>PROPERTIES and CHANGES of MATERIALS</b> 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. 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>Know some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. Know mixtures can be separated by filtering, sieving and evaporation. Know and name some changes to materials such as dissolving, mixing and changes of state are reversible. Know and name some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.</p> <p><b>Working scientifically:</b> Key investigations: Sort and classify materials, fair test- which dissolves the best? Pattern seeking- is all baking heating?</p>	<p><b>EARTH, SUN and MOON</b> 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> <p>Know the Sun is a star and at the centre of our solar system. Know there are 8 planets that travel around the Sun in fixed orbits. Know Earth takes 365¼ days to complete its orbit around the Sun – 1 yr. Know the Earth rotates on its axis every 24 hours – 1 day. Know as Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). Know as the Earth rotates, the Sun appears to move across the sky. Know the Sun doesn’t move. Know the Moon orbits the Earth and takes about 28 days to complete its orbit. Know the Sun, Earth and Moon are approximately spherical.</p> <p><b>Working Scientifically:</b> Key investigations: research using secondary sources- how does day and night occur? Pattern seeking- what changes in the moon can we see? Why do shadows change during the day?</p>	<p><b>FORCES</b> 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. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p> <p>Know a force causes an object to start moving, stop moving, speed up, slow down or change direction. Know gravity is a force that acts at a distance. Know everything is pulled to the centre of the Earth by gravity. Know this causes unsupported objects to fall. Know Sir Isaac Newton discovered and did a lot of work around gravity. Know air resistance, water resistance and friction are contact forces that act between moving surfaces. Know a mechanism is a device that allows a small force to be increased to a larger force. Know pulleys, levers and gears are all mechanisms. Know and explain how the simple mechanisms work.</p> <p><b>Working scientifically:</b> Key investigations: fair test- what falls fastest? What has the greatest force?</p>	<p><b>LIVING THINGS AND THEIR HABITATS</b> 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> <p>Know that the life cycle of a living thing is a series of stages of development starting with a fertilized egg in animals or a seed in many plants Know that in most mammals (e.g. dogs) a fertilized egg develops in the womb into an embryo and is then born and fed on milk before it is weaned onto the food that is adapted to eat; it then develops to maturity in a period called adolescence after which it can reproduce and cycle can begin again. Know that in amphibians (e.g. frogs) a fertilized egg develops into an embryo and then hatches into a tadpole; the tadpole develops adult characteristics, metamorphoses into the adult form after which it can reproduce and the cycle can begin again Know that in many insects a fertilized egg develops into wingless feeding form called a larva (caterpillar); the larva feeds then later becomes a pupa (chrysalis) with a protective cocoon; inside this cocoon, the pupa metamorphoses into the adult butterfly after which it can reproduce and the cycle can begin again. Know that in birds (e.g. robins) a fertilized egg hatches in a nest and is fed by its parents until it is ready to fly; it then leaves the nest and grows into an adult after which it can reproduce and the cycle can begin again</p> <p><b>Working Scientifically:</b> Key investigations: pattern seeking- do all amphibians reproduce the same way?</p>	<p><b>ANIMALS including HUMANS</b> Describe the changes as humans develop to old age.</p> <p>Know that humans go through stages of development; they begin as fertilized eggs and then develop into embryos before developing into babies; once they are born, these newborn babies become infants (roughly 2 months to 2 years) then into young children (roughly 2-12 years old); children develop into adults during adolescence (roughly 12-16 years old) at which age they become physically capable of reproduction; as adults develop into old age (roughly 55+ years old) they experience changes in their body which require them to move more carefully and rest more frequently</p> <p><b>Working scientifically -</b> Key investigations: observation over time, how do we change over the year,</p>
Vocabulary	Thermal, electrical insulator/conductor, magnetic, brittle, fragile, decompose, durable.	change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material	Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets	Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears	Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, asexual, metamorphosis, runners, bulbs, cuttings.	
Key Texts						
Trips Visitors			Jodrell Bank	Chorlton Water Park	Ashley House Care Home	



<p>Year 6</p>	<p><b>ANIMALS including HUMANS</b> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. 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> <p>Know that the heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbondioxide 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. Know that the heart beats, pumping blood around the body and that blood vessels carry the blood; arteries carry blood away from the heart; veins carry blood towards the heart; capillaries are tiny blood vessels that connect arteries and veins Know that the heart is composed of four chambers: two atria and two ventricles; the aorta is the largest artery in the body and most major arteries branch off from it. 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. Know this is the human circulatory system. Know that blood travels around the body transporting nutrients that have been absorbed into the bloodstream from digestion; blood also absorbs oxygen from the lungs and carries it around the body which is used to power the body; this use of oxygen to create energy is called respiration Know that diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well our 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. Know some conditions are caused by deficiencies in our diet e.g. lack of vitamins. Know that when we exercise, our heart beats more frequently so that the oxygen that is used around the body can be replenished; it returns to a resting heart rate afterwards; fitter people tend to have lower resting heart rates Know that drugs are chemicals that have an impact on the natural chemicals in a person’s body; know that drugs can be harmful or helpful, depending on what they are and how they are used; know that all drugs can be harmful if overused</p>	<p><b>LIGHT</b> 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. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> <p>Know that 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. Know that translucent objects allow some light to pass through, but some of the light changes direction as it passes through the object; this means that an something seen through a translucent object is not clearly defined Know that when light passes from one medium to another (e.g. from air to water), it changes direction; this is called refraction; this happens because light travels at different speeds in different media Know that white light comprises all the colours of light Know that white light refracted by two surfaces in a prism will spread out so that all of its constituent colours can be seen; this array of colours is called a spectrum; it happens because the different colours that constitute white light travel at different speeds Know how to draw a diagram to show why the shape of a shadow will match the shape of an object Know that when light reflects off an object, the angle of incidence is equal to the angle of reflection (see diagram below) Know that a periscope takes advantage of the predictable angles of incidence and reflection to allow an image to be shown to a viewer</p> <p><b>Working Scientifically</b> Key investigations: Why can I hear round corners but not see round corners? Chn to use mirrors and torches to investigate how light travels in straight lines and reflects off mirrors. Pattern seeking.</p>	<p><b>ELECTRICITY</b> Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. 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> <p>Know how to draw simple circuit diagrams Know the recognized symbols for a battery, bulb, motor, buzzer and wire. Know how to predict whether components will function in a given circuit, depending on whether or not the circuit is complete; whether or not a switch is in an on or off position; and whether or not there is a cell to provide electrical current to the circuit. Know that voltage is a measure of the power of a cell to produce electricity; it is a measure of the ‘push’ of electric current, not the size of the electric current. Know that as the number and voltage of cells in a circuit increases, the brightness of a bulb or the volume of a buzzer will increase (though too high a voltage may ‘blow’ the bulb or buzzer) Know that two bulbs in a circuit can be wired up to create a series circuit or a parallel circuit; if one bulb blows in a series circuit the other will not shine as the circuit has been broken; in contrast, if one bulb blows in a parallel circuit there will still be a complete circuit for the other bulb so it will continue to shine; use this knowledge to explain the advantages of using parallel circuits (e.g. in the lighting in homes) Know that by 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.</p> <p><b>Working Scientifically:</b> Key investigations: Key investigations: Is it possible to change how bright a bulb is or how loud a buzzer is? Does the length of the wire affect the brightness of the bulb? Chn create circuits to investigate the effect of different voltages on different components. Pattern seeking /fair testing</p>	<p><b>LIVING THINGS AND THEIR HABITATS</b> 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> <p>Know that 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. Know that plants can make their own food whereas animals cannot. Know that animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates). Know that vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals. Each group has common characteristics. Know that invertebrates can be divided into a number of groups, including insects, spiders, snails and worms. Know that plants can be divided broadly into two main groups: flowering plants; and non-flowering plants. Know that there are three types of micro-organism: viruses, fungi and bacteria; of these three, viruses are often not really considered to be alive by many scientists mainly because they don’t have the ‘machinery’ to reproduce inside them Know that germs are disease-causing micro-organisms Know that an arthropod is an invertebrate with a hard, external skeleton and jointed limbs Know that insects are a type of arthropod; their bodies consist of six legs, a head, a thorax and an abdomen; most insects also have a pair of antennae and a pair of wings Know that an arachnid (e.g. spider) is a type of arthropod with eight legs and no antennae or wings. Know that a crustacean is a type of arthropod with two pairs of antennae (e.g. woodlouse) Know that a myriapod is an arthropod with a flat and long or cylindrical body and many legs (e.g. centipede) <b>Know about the environmental and conservation work of Jane Goodall</b></p> <p><b>Working Scientifically:</b> Key investigations: sort and classify living things on basis of characteristics, pattern seeking of mammal group- what observable characteristics</p>	<p><b>EVOLUTION and INHERITANCE</b> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p> <p>Know that all living things have offspring of the same kind, as features in the offspring are inherited from the parents. Know that due to sexual reproduction, the offspring are not identical to their parents and vary from each other. Know that natural selection is the cause of this change; natural selection works as there is natural variation within a species; there is also competition to survive and reproduce and that members of a species with advantageous characteristics survive and reproduce - these characteristics are passed down to their offspring; members of a species with less advantageous characteristics do not survive and reproduce – these characteristics are not passed down to offspring Know that 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.</p> <p>Know that 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, <b>scientists such as Darwin and Wallace and the work of John Edmonton (BHM)</b> observed how living things adapt to different environments to become distinct varieties with their own characteristics. Know that all life on Earth began from a single point around 4.5 thousand million years ago Know that the gradual change of species over millions of years can be observed by looking at examples of fossils Know that Charles Darwin posited this theory of evolution by natural selection</p>
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	<p>Know that paracetamol and aspirin are examples of drugs that can be helpful as a painkiller.</p> <p>Know the work of Edward Jenner and Alexander Fleming.</p> <p>Compare to the modern development of vaccines.</p> <p>Know that cannabis and cocaine are examples of illegal drugs that can have serious negative effects</p> <p>Know that alcohol and tobacco are examples of drugs that are legal to adults but that can have serious negative effects, such as liver disease and lung disease, respectively</p> <p><b>Working Scientifically:</b></p> <p>Key investigations: sort and classify food groups on basis of impact on body function- what will happen if we eat too much sugar, obs over time- change in heart rate before and after eating and exercise</p>			<p>are there? Obs over time- mould growing on bread, oranges,</p>	<p><b>Working Scientifically:</b></p> <p>Key investigations: Why do different species of animals look different? Chn sort various species of animals into the environments in which they are adapted based on their physical attributes and listed behaviours Grouping and classifying</p>
Vocabulary	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle. vaccine	straight lines, light rays, angle of incidence, angle of reflection, refraction, spectrum, translucent, medium, periscope	Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage	Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering Retrieval vocab: component, habitat, plant, structure, fish, bird, amphibian, reptile, mammal, kingdom, classification key, species, fungi, bacteria, characteristics, offspring, vertebrate, invertebrate, insect micro-organism, virus, thorax, arthropod, abdomen, arachnid, antenna	Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils, evolution, natural selection, variation, advantageous
Key Texts				The Bacteria Book	Moth. Darwin’s Amazing Voyage of Discovery
Trips Visitors	Lancashire Cricket Club- Healthy Heart				Manchester Museum