



	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6	
3	Rocks (including fossils) <ul style="list-style-type: none"> to compare and group different kinds of rocks on the basis of appearance and simple physical properties to describe in simple terms how fossils are formed when things that have lived are trapped within rock to recognise that soils are made from rocks and organic matter 	The skeleton (animals, including humans) <ul style="list-style-type: none"> to identify that some animals have skeletons and muscles for support, protection and movement Identify that animals, including humans, need the right types and amounts of nutrition, and that they cannot make their own food; they get nutrition from what they eat 	Animals including humans (nutrition) <ul style="list-style-type: none"> **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 identify that humans and some other animals have skeletons and muscles for support, protection and movement** 	Plants <ul style="list-style-type: none"> **identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers** investigate the way in which water is transported within plants explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant 	Forces and Magnets <ul style="list-style-type: none"> to compare how things move on different surfaces to notice that some forces need contact between 2 objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials to describe magnets as having 2 poles predict whether two magnets will attract or repel each other, depending on which poles are facing 	Light and Shadow <ul style="list-style-type: none"> recognise that they need light in order to see things and that dark is the absence of light notice that light is reflected from surfaces recognise that shadows are formed when the light from a light source is blocked by an opaque object find patterns in the way that the size of shadows change recognise that light from the sun can be dangerous and that there are ways to protect their eyes 	
	Skills						
	<ul style="list-style-type: none"> I recognise that fossils provide information about living things that inhabited the Earth millions of years ago I can group rocks according to their appearance and simple physical properties I can describe in simple terms how fossils are formed (living things trapped between rocks) 	<ul style="list-style-type: none"> I know that animals cannot make food and get their nutrition from what they eat I know that some animals have skeletons and muscles for support protection and movement I can identify the different types of teeth in humans and their basic functions 	<ul style="list-style-type: none"> I know that animals cannot make food and get their nutrition from what they eat I know that some animals have skeletons and muscles for support protection and movement I can identify the different types of teeth in humans and their basic functions 	<ul style="list-style-type: none"> I can describe the function of the parts of a flowering plant (roots, stem, leaf, stamen, carpel) I can explore the requirements for plant growth (air, light, water, nutrients from soil, room) 	<ul style="list-style-type: none"> I recognise that some forces need contact between 2 objects, but magnetic forces can act at a distance I can group a variety of everyday materials according to their magnetic properties I can describe magnets as having 2 poles I can predict whether 2 magnets will attract or repel each other, depending on which poles are facing 	<ul style="list-style-type: none"> I recognise that light is necessary to see things I notice that light is reflected from some surfaces I recognise that light from the sun can be dangerous and that there are ways to protect eyes I recognise that shadows are formed when light is blocked by a solid object 	

<ul style="list-style-type: none"> I know that soils are made from rocks and organic matter 				<p>I can describe some of the factors which increase/reduce how fast or slow things move</p>	<ul style="list-style-type: none"> I can explain how shadow length changes according to the position of light source (including the position of the sun)
Scientific Enquiry					
<p>Observe rocks closely Classify rocks in a range of ways based on their appearance Devise a test to investigate how much water different rocks absorb Observe how rocks change over time e.g. gravestones or old building Research using secondary sources how fossils are formed Observe soils closely Classify soils in a range of ways based on their appearance Observe how soil can be separated through sedimentation Research the work of Mary Anning</p>	<p>Use secondary sources to research the parts and functions of the skeleton Investigate pattern seeking questions such as</p> <ul style="list-style-type: none"> Can people with longer legs run faster? Can people with bigger hands catch a ball better? Can people with longer arms throw further? <p>Children to ask and investigate own questions. Compare, contrast and classify skeletons of different animals (Exoskeleton, Endoskeleton, Hydroskeleton)</p>	<p>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</p>	<p>Observe what happens to plants over time when the leaves or roots are removed Observe the effect of putting cut white carnations or celery in coloured water Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space Spot flowers, seeds, berries and fruits outside throughout the year Observe flowers carefully to identify the pollen Observe flowers being visited by pollinators e.g. bees and butterflies in the summer Observe seeds being blown from the trees e.g. sycamore seeds Research different types of seed dispersal Classify seeds in a range of ways including by how they are dispersed Create a new species of flowering plant</p>	<p>Carry out investigations to explore how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc. Explore what materials are attracted to a magnet Classify materials according to whether they are magnetic Explore the way that magnets behave in relation to each other Use a marked magnet to find the unmarked poles on other types of magnets Explore how magnets work at a distance e.g. through the table, in water, jumping paper clip up off the table Devise an investigation to test the strength of magnets</p>	<p>Explore how different objects are more or less visible in different levels of lighting Explore how objects with different surfaces e.g. shiny vs matt are more or less visible Explore how shadows vary as the distance between a light source, an object or surface is changed Explore shadows which are connected to and disconnected from the object e.g. shadows of clouds and children in the playground Choose suitable materials to make shadow puppets Create artwork using shadows</p>
Key Knowledge					

<ul style="list-style-type: none"> • There are many different kinds of rocks such as chalk, marble and granite. • Weather can cause rocks to erode (break down into smaller pieces). • Some rocks are permeable – they let water soak in and some rocks are impermeable – water cannot soak in. • Fossils are formed when things that have lived are trapped within rock for thousands of years. • Soils are made up from rocks and organic matter such as rotten leaves and plants. 			<ul style="list-style-type: none"> ⊕The roots support the plant in the soil and absorb water and nutrients from the ground ⊕The stem supports the plant and helps the water and nutrients travel to the leaves ⊕The leaves use sunlight to make food for the plant ⊕The flowers are needed to attract insects and to make the pollen and eggs (that are used to make seeds) ⊕ Seeds need warmth, water and oxygen to germinate ⊕Plants need light, water, air, nutrients from the soil and room to grow ⊕Pollination is when pollen is transferred from flower to flower by wind or insects ⊕ In the life cycle of a flowering plant, seeds are dispersed, then grow, buds form then flower, once they flower they are pollinated, the flower then dies and seeds are produced once again ⊕Seeds are dispersed (spread) by wind, animals or water 	<ul style="list-style-type: none"> • Gravity is a force that causes objects to fall to the floor. • Air resistance is a force that pushes back at the object falling. • Friction happens when two objects rub against each other. • Magnets have two poles called north and south that either attract or repel against each other. • Some materials are magnetic so attract (stick) to the magnet. • Some materials are not magnetic so repel (don't stick) to the magnet. 	<ul style="list-style-type: none"> • There are many different sources of light natural – sun, stars. Man-made – lightbulbs, tvs, computer screens. • We need light in order to see things and that dark is the absence of light. • Light is reflected from surfaces, these are not light sources. • The sun can be dangerous to our eyes and skins and we can protect ourselves by using sun cream, wearing sunglasses and hats. • Materials can let different amounts of light through them, they can be opaque where no light passes through, translucent where some light passes through and transparent where all light passes through. • Shadows are formed when the light from a light source is blocked by an opaque object. • The position of the sun throughout the day causes the length of our shadow to change – early morning and late evening our shadows are long, when the sun is high in the sky at midday our shadows are short.
Key Vocabulary					
<p>Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, peat, sandy/chalk/clay soil, permeable, impermeable, fossilisation, sediment, topsoil, subsoil, baserock, erosion, weathering, igneous, sedimentary, metamorphic</p>	<p>Skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints</p>	<p>Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water,</p>	<p>Roots, stem, leaves, flower, nutrients, pollen, pollination, seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal, life cycle</p>	<p>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</p>	<p>Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous</p>

Famous Scientists					
Mary Anning (Discovery of Fossils)	Marie Curie (Radiation / X-Rays)	Adelle Davis (20 th Century Nutritionist)	Joseph Banks (Botanist)	Isaac Newton (Theory of gravity)	
Inge Lehmann (Earth's Mantle)				Michael Faraday (Study of ElectroMagnetism)	
Prior Learning					
<p>Year 1 Everyday materials 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.</p> <p>Year 2 Everyday materials Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p>	<p>Year 2 Know that animals, including humans, have offspring which grow into adults Know the basic stages in a life cycle for animals, including humans. Find out and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>Year 1 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.</p>	<p>Year 2 **Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>Year 2 Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p>Year 1 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. Identify and name the roots, trunk, branches and leaves of a tree.</p>		

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
4	<p>States of matter</p> <ul style="list-style-type: none"> • S, L, G • Water cycle • to compare and group solids, liquids and gases • to observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) • to identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature 	<p>Sound</p> <ul style="list-style-type: none"> • to identify how sounds are made, associating some of them with something vibrating • to recognise that vibrations from sounds travel through a medium to the ear • to find patterns between the pitch of a sound and features of the object that produced it • to find patterns between the volume of a sound and the strength of the vibrations that produced it • to recognise that sounds get fainter as the distance from the sound source increases 	<p>**Animals including humans**</p> <ul style="list-style-type: none"> • Digestion • Teeth • Describe the simple functions of the basic parts of the digestive system in humans • Identify the different types of teeth in humans and their simple functions • Construct and interpret a variety of food chains, identifying producers, predators and prey. 		<p>Living things and their habitats</p> <ul style="list-style-type: none"> • to recognise that living things can be grouped in a variety of ways • to explore and use classification keys to help group, identify and name a variety of living things in the local and wider environment • to recognise that environments can change and that this can sometimes pose dangers to living things 	<p>Electricity</p> <ul style="list-style-type: none"> • identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • recognise some common conductors and insulators, and associate metals with being good conductors
	Skills					

<ul style="list-style-type: none"> • I can classify and describe materials according to whether they are solids, liquids or gases • I can say how some materials change state when they are heated or cooled • I can measure or research the temperature at which a specific material changes state • I know how evaporation and condensation play a part in the water cycle • I know how the rate of evaporation in the water cycle is linked to temperature • I describe the differences between the properties of different materials 	<ul style="list-style-type: none"> • I recognise that vibrations from sounds travel through a medium to the ear • I can suggest how a range of sounds are made • I recognise that sounds get fainter as the distance from the sound source inc. 	<ul style="list-style-type: none"> • I know that animals cannot make food and get their nutrition from what they eat • I can describe the simple function and basic parts of the human digestive system • I can identify the different types of teeth in humans and their basic functions • I can create and interpret simple food chains and name the producer, predator and prey 	<ul style="list-style-type: none"> • I can group living things in a variety of ways • I recognise that environments can change and that this can pose dangers to living things • I use classification keys to group, identify and name a variety of living things in their environment 	<ul style="list-style-type: none"> • I can make a simple series electrical circuit and name the basic parts of cells, wires, bulbs, switches and buzzers • identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery • I can use a simple switch in a circuit that opens and closes and identify whether or not a lamp lights in a simple series circuit • I can name some common conductors and insulators and know that metals are good conductors
Scientific Enquiry				

	<p>Observe closely and classify a range of solids Observe closely and classify a range of liquids Explore making gases visible e.g. squeezing sponges under water to see bubbles, and showing their effect e.g. using straws to blow objects, trees moving in the wind Classify materials according to whether they are solids, liquids and gases Observe a range of materials melting e.g. ice, chocolate, butter Investigate how to melt ice more quickly Observe the changes when making rocky road cakes or ice-cream Investigating melting point of different materials e.g. ice, margarine, butter and chocolate Explore freezing different liquids e.g. tomato ketchup, oil, shampoo Use a thermometer to measure temperatures e.g. icy water (melting), tap water, hot water, boiling water (demonstration) Observe water evaporating and condensing e.g. on cups of icy water and hot water Set up investigations to explore changing the rate of evaporation e.g. washing, puddles, handprints on paper towels, liquids in containers Use secondary sources to find out about the water cycle</p>	<p>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</p>	<p>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</p>	<p>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</p>	<p>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</p> <p>N.B. Children should be given one component at a time to add to circuits.</p>
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Key Knowledge

- The 3 states of matter are: solids, liquids and gases
- In a solid state, a material holds its shape
- In a liquid shape, the material holds the shape of the container
- In the gas state, particles can escape from open containers. The particles move in all directions
- Particles are what materials are made from
- When water is heated the particles move faster until they can move freely. The water evaporates into a water vapour
- When water is cooled, the particles start to slow down until a solid structure is formed. The water has frozen.
- The water cycle is the name of the process that follows water as it moves around the earth in different states.

- Sound is a thing that can be heard
- Sound is made when objects vibrate
- Sound waves need to travel through a medium such as air, water, glass or brick
- When an object vibrates, the air around it vibrates. These are known as sound waves
- Pitch is a measure of how high or low a sound is
- Volume is a measure of how loud a sound is
- We measure sound using amplitude and decibels

The Digestive System

- C
- How do animals feed and digest?
 What happens to food in our bodies?
 How do animals get their energy?
 What are the organs of the digestive system and what are their functions?
- Teeth**
- Incisors – cut food like a knife
 - Canines – rip and tear food
 - Premolars – holds and crushes food
 - Molars – crush and grind food
 - Wisdom – no longer hold a function
 - Enamel is a protective layer for the teeth
 - Tooth decay can be caused by many things including: poor diet, not brushing teeth regularly and not visiting the dentist regularly
 - Carnivores eat only meat and need more or bigger canines to help rip and tear through their food.

- The billions of different kinds of living things (organisms) on earth have been divided up, by scientists, into groups according to their similarities and differences. This is known as classifying.
- Classifying living things into groups allows scientists to learn more about what makes each species unique.
- There are many different classes of animals. Those with backbones are known as the ‘class’ vertebrates. These are then grouped into mammals, birds, fish, reptiles and amphibians.
- Invertebrates, animals without backbones, are arachnids, insects, snails and slugs and worms.
- Humans fall into the mammal class as they have hair on their bodies and drink milk when they are babies. Whales, dolphins, bats, cats, dogs and hedgehogs are also mammals.
- A habitat is the non-living environment surrounding a living thing. It provides space, shelter, food and water.
- An ecosystem is made up of the living organism and the non-living habitat. An ecosystem can be any size from a tree to the whole world.

- Electricity is generated using energy from natural sources such as sun, oil, water and wind
- Some appliances use batteries and some use electricity to enable them to run
- A complete circuit is a loop that allows electrical current to flow through wires
- A circuit contains a battery, wires and an appliance that requires electricity to work (such as a bulb, motor or buzzer)
- The electrical current flows through the wires from the battery to the appliance
- Objects that are made from materials that allow electricity to pass through them are called electrical conductors
- Objects that are made from materials that do not allow electricity to flow through them are called electrical insulators

Key Vocabulary

Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle

Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation

Digestive system, digestion, absorb, excretion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, enamel, tooth decay

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, symbol N.B. Children in year 4 do not need to use standard symbols as this is taught in year 6
Famous Scientists				
Anders Celsius (Celsius Temperature Scale)	Aristotle (Sound Waves)	Ivan Pavlov (Digestive System Mechanisms)	Cindy Looy (Environmental Change and Extinction)	Thomas Eddison (First Working Lightbulb)
Daniel Fahrenheit (Fahrenheit Temperature Scale / Invention of the Thermometer)	Galileo Galilei (Frequency and Pitch of Sound Waves) Alexander Graham Bell (Invented the Telephone)	Joseph Lister (Discovered Antiseptics)	Jaques Cousteau (Marine Biologist)	Joseph Swan (Incandescent Light Bulb)
Prior Learning				
		Year 3 Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. Know how nutrients, water and oxygen are transported within animals and humans. Know about the importance of a nutritious, balanced diet. Identify that humans and some other animals have skeletons and muscles for support, protection and movement: Know about the skeletal and muscular system of a human.	Year 2 Explore and compare the difference between things that are living, dead and things that have never been alive. Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. Identify and name a variety of plants and animals in their habitats, including micro habitats. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name the different sources of food.	

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
5	Forces <ul style="list-style-type: none"> explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object identify the effects of air resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect 	Properties and Changes of Materials <ul style="list-style-type: none"> to compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets to know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution to use knowledge of solids, liquids and gases to separate mixtures, including through filtering, sieving and evaporating to give reasons, based on evidence from comparative and fair tests, for uses of everyday materials, including metals, wood and plastic to demonstrate that dissolving, mixing and changes of state are reversible changes to 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 	Earth and Space (Our Place In Space) <ul style="list-style-type: none"> describe the Sun, Earth and Moon as approximately spherical bodies** 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** use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky 		Living things and their habitats <small>(Living things: The life cycle of plants)</small> <ul style="list-style-type: none"> describe the life process of reproduction in some plants and animals 	Living things and their habitats <ul style="list-style-type: none"> describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Animals including humans (Birth to death) <ul style="list-style-type: none"> to describe changes as humans develop to old age
	Skills					
	<ul style="list-style-type: none"> I can explain the effects of air and water resistance and friction I recognise that some mechanisms allow a smaller force to have a greater effect I can describe the effects of a variety of forces <i>e.g. magnetism, friction and gravity</i> 	<ul style="list-style-type: none"> I can group materials according to their properties I can name some materials that will dissolve in liquid to form a solution I can describe how to get back a material from a solution I can describe how mixtures could be separated I can give scientific reasons for the uses of everyday materials 	<ul style="list-style-type: none"> I can describe the movement of the Earth and other planets relative to the sun I can describe the movement of the moon and the Earth I can describe the sun, Earth and moon as spherical I can explain the process of day and night I can explain that objects fall to Earth due to gravity 		<ul style="list-style-type: none"> I can explain how water and nutrients are transported in plants I can explain the processes of fertilisation, pollination and seed dispersal 	<ul style="list-style-type: none"> I can describe the differences in the life cycles of a mammal, a bird, an amphibian and an insect I can describe the process of reproduction in some plants and animals I can describe changes as humans develop to old age

<ul style="list-style-type: none"> • I can describe how friction affects the movement of objects 	<ul style="list-style-type: none"> • I can demonstrate reversible changes • I can discuss some irreversible changes • I can describe some properties of metal • I can describe the properties of a range of solids • I can explain the relationship between liquids, solids and gases • I can identify a range of contexts in which condensation and evaporation take place • I know how to separate a range of mixtures 			
Scientific Enquiry				
<p>in a range of contexts e.g. trainers, bath mats, mats for a helter-skelter Investigate the effect of friction</p> <p>Investigate the effects of water resistance in a range of contexts e.g. dropping shapes through water, pulling shapes e.g. boats along the surface of water</p> <p>Investigate the effects of air resistance in a range of contexts e.g. parachutes, spinners, sails on boats</p> <p>Research how the work of scientists such as Isaac Newton helped to develop the theory of gravitation.</p>	<p>Explore adding a range of solids to water and other liquids e.g. cooking oil, as appropriate.</p> <p>Investigate rates of dissolving by carrying out comparative and fair test</p> <p>Separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture</p> <p>Explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning</p> <p>Carry out comparative and fair tests involving non-reversible changes e.g.</p>	<p><i>*(Remote learning has meant we have not been able to carry out these investigations first hand/ hands on)</i></p> <p>Use first hand sources to help create a model e.g. role play or using balls, to show the movement of the Earth around the Sun and the Moon around the Earth.</p> <p>Use secondary sources to help make a model to show why day and night occur</p> <p>Oreo activity – demonstrating the phases of the moon.</p>	<p>Use first hand sources to observe the parts of a flower. E.g. Dissecting Lilies.</p>	<p>Use secondary sources and, where possible, first hand observations to find out about the life cycle of a range of animals</p> <p>Compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth</p> <p>Look for patterns between the size of an animal and its expected life span</p>
Key Knowledge				
<ul style="list-style-type: none"> • Forces are measured in Newtons • Gravity is a force that pulls objects towards the centre of the Earth • Air resistance is a force that slows down moving objects • Water resistance is a force that slows down moving objects too 	<ul style="list-style-type: none"> • The structure of solids liquids and gases are all different. Particles in a: gas are well separated with no regular arrangement. Liquids are close together with no regular arrangement. Solids are tightly packed, usually in a regular pattern. • Materials can be sorted into categories basis on their properties. These can include their hardness, 	<ul style="list-style-type: none"> • That the Earth takes 365 ¼ days to orbit the Sun. • Day and night are a result of the Earth’s rotation on its axis. • There are 8 planets in our solar system that orbit the sun: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune (Pluto was reclassified as a ‘dwarf planet’ in 2006) and be able to recall some key facts about each of these. • The moon is a celestial body that orbits a planet. 	<ul style="list-style-type: none"> • That plants reproduce both sexually and asexually. • That sexual reproduction in flowering plants occurs through pollination, usually involving wind or insects. • That asexually reproduction in plants involves only one parent plant and doesn’t require 	<ul style="list-style-type: none"> • Life cycles of a mammal, amphibian, insects and birds are all different but share similar characteristics and need to reproduce in order for their species to survive. • Humans go through a variety of changes in our lifecycle. These stages (from fertilisation, gestation and

<ul style="list-style-type: none"> • Friction is a force between two objects that are touching • Some mechanisms, such as pulleys, gears and levers, allow a smaller force to have a bigger effect 	<p>solubility, transparency, conductivity (electrical and thermal) and response to magnets.</p> <ul style="list-style-type: none"> • Materials that are a solute dissolve in water (e.g salt and sugar). When these dissolve in a liquid they create a solution. • You can separate a solute from a solution through the process of evaporation. • A mixtures contains a solute or different substances in a solvent. These substances might be separated, through filtering, sieving and evaporating. • Reversible and irreversible reactions are different. A reversible change is a change that can be undone or reversed. If you can get back the substances you started the reaction with, that's a reversible reaction. • A change is called irreversible if it cannot be changed back again. In an irreversible change, new materials are always formed. Sometimes these new materials are useful to us. 	<ul style="list-style-type: none"> • The Luna moon orbits earth and the changing appearance represents different phase due to the moon's position as it orbit every 28 day. 	<p>pollination. Examples include bulbs, tubers, runners and plantlets.</p> <ul style="list-style-type: none"> • Know how and why gardeners may force plants to reproduce asexually by taking cuttings. • The work of a famous naturalists (David Attenborough) and his contribution on the study of plants and natural history. 	<p>birth) include the following: baby, toddler, child, teenager, adulthood, old age and death.</p> <ul style="list-style-type: none"> • The human gestation period (average 9 months) can differ from other animals. • That human bodies go through many physical changes during their lifetime including developing adult teeth, growing body hair, developing breasts and menstruating (girls) • That hormones can effect a human's emotional state as we grow and develop. • Puberty usually takes place during the adolescence stage of development • Know that having a healthy lifestyle can help us to live longer
Key Vocabulary				
<p>air resistance, balanced force , force diagram forcemeter friction gravity mass lever newtons pulley, speed stationary unbalanced upthrust water resistance weight</p>	<p>Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve reversible/non-reversible change, burning, rusting, new material</p>	<p>Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune) spherical, solar system, rotates, star, orbit, planets, galaxies, NASA, universe, astronaut</p>	<p>life cycle species reproduce germinate pollination fertilization seed dispersal stamen style, stigma sepal, petal ovary pollen naturalist metamorphosis, asexual</p>	<p>Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, Puberty: the vocabulary to describe sexual characteristics</p>
Famous Scientists				
<p>Galileo Galilei (Gravity and Acceleration)</p> <p>Isaac Newton (Gravitation)</p> <p>Archimedes of Syracuse</p>	<p>Spencer Silver, Arthur Fry and Alan Amron (Post-It Notes)</p> <p>Ruth Benerito (Wrinkle-Free Cotton)</p>	<p>Tim Peake- British army officer and astronaut for ESP (European Space Agency).</p> <p>Neil Armstrong- American astronaut, also first man to walk on the moon.</p> <p>Buzz Aldrin- American astronaut- second man to walk on the moon.</p> <p>Yuri Gagarin- Russian astronaut- first man to go to space.</p>	<p>David Attenborough (Naturalist and Nature Documentary Broadcaster)</p>	<p>Ian Donald-(Obstetrician invented the Ultrasound for clinical purposes in1956)</p>

(Levers)		Helen Sharman (First British astronaut)		
Prior Learning				
<p>Year 3 to compare how things move on different surfaces to notice that some forces need contact between 2 objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials to describe magnets as having 2 poles predict whether two magnets will attract or repel each other, depending on which poles are facing</p>	<p>Year 4 Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>		<p>Year 4 Recognise that environments can change and that this can sometimes pose danger to living things. Year 3 Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary from plant to plant. Know the way in which water is transported within plants. Know the way in which water is transported within plants.</p>	

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
	Living things and their habitats <ul style="list-style-type: none"> 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 	Light and how we see <ul style="list-style-type: none"> to recognise that light travels in straight lines 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 that objects are seen because they give out or reflect light into the eye use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them 	Evolution and inheritance <ul style="list-style-type: none"> recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago 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. 	Animals including Humans <ul style="list-style-type: none"> identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood describe the ways in which nutrients and water are transported within animals, including humans **recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function** 	Electricity <ul style="list-style-type: none"> to associate lamp brightness or volume of a buzzer with the number/voltage of cells 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 to use recognised symbols in a simple circuit diagram 	<ul style="list-style-type: none"> Science revision Topics
	Skills					
6	<ul style="list-style-type: none"> I can group living things according to common observable characteristics, including microorganisms, plants and animals I can describe the differences in the life cycles of a mammal, a bird, an amphibian and an insect 	<ul style="list-style-type: none"> I recognise that light travels in straight lines I can explain that we see things because light travels from light sources to our eyes (or via reflections) I can describe the way the Sun's (and shadows) position changes through the day I can explain that shadows have the same shape as the objects that cast them 	<ul style="list-style-type: none"> I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution 	<ul style="list-style-type: none"> I know that animals need the right amount of nutrition to stay healthy I can describe changes as humans develop to old age I can name the main parts of the human circulatory system I recognise the impact of diet, exercise, drugs and lifestyle on the way the body functions I can create and interpret complex food chains and name the producers, predators and prey I can explain how changing variables within 	<ul style="list-style-type: none"> I understand the difference between electrical conductors and insulators I understand how lamp brightness and buzzer volume is affected by the voltage in a circuit I use recognised symbols in a simple circuit diagram 	<ul style="list-style-type: none">

			a food chain might affect the habitat		
Scientific Enquiry					
<p>Use secondary sources to learn about the formal classification system devised by Carl Linnaeus and why it is important</p> <p>Use first hand observation to identify characteristics shared by the animals in a group</p> <p>Use secondary sources to research the characteristics of animals that belong to a group</p> <p>Use information about the characteristics of an unknown animal or plant to assign it to a group</p> <p>Classify plants and animals presenting this in a range of ways – Venn diagrams, Carroll diagrams and keys</p> <p>Create an imaginary animal which has features from one or more groups</p>	<p>Light and how we see</p> <p>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</p> <p>Explore the uses of the behaviour of light, reflection and shadows such as in periscope design, rear view mirrors and shadow puppets.</p>	<p>Design a new plant or animal to live in a particular habitat</p> <p>Use models to demonstrate evolution e.g. Darwin’s finches bird beak activity</p> <p>Use secondary sources to find out about how the population of peppered moths changed during the industrial revolution</p> <p>Make observations of fossils to identify living things that lived on Earth millions of years ago</p> <p>Identify features in animals and plants that are passed on to offspring</p> <p>Explore this process by considering the artificial breeding of animals or plants e.g. dogs</p> <p>Compare the ideas of Charles Darwin and Alfred Wallace on evolution</p> <p>Research the work of Mary Anning and how this provided evidence of evolution</p>	<p>Create a role play model for the circulatory system</p> <p>Carry out a range of pulse rate investigations</p> <ul style="list-style-type: none"> Fair test – effect of different activities on my pulse rate 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 <p>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</p>	<p>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</p> <p>Make circuits to solve particular problems such as a quiet and a loud burglar alarm</p> <p>Carry out fair tests exploring changes in circuits</p> <p>Make circuits that can be controlled as part of a D&T project</p>	
Key Knowledge					
<ul style="list-style-type: none"> Living things (including micro-organisms, plants and animals) are classified into broad groups according to common observable characteristics and based on similarities and differences We classify plants and animals to make sure they 	<p>What I will know by the end of the unit...</p> <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago that living things produce offspring of the same kind, but normally offspring vary 		<ul style="list-style-type: none"> You can brighten a bulb or make a buzzer louder by adding more batteries or by using batteries with a higher voltage The more bulbs you add, the dimmer the light If you added more buzzers to a circuit, then the noise they make would be quieter 	

<p>are named, grouped and identified correctly.</p> <ul style="list-style-type: none"> • Micro-organisms are living things too small to see with the naked eye. Viruses and bacteria are examples of micro-organisms. • Not all microbes are harmful – some even help keep our bodies healthy! 	<ul style="list-style-type: none"> • A shadow is formed when the light is blocked • 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>and are not identical to their parents</p> <ul style="list-style-type: none"> • how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. 		<ul style="list-style-type: none"> • In a series circuit there is only one path for the current to flow through • When scientists draw electrical circuits, they use scientific symbols to show the different components (see KO) 	
Key Vocabulary					
Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non-flowering	<p>Light and how we see</p> <p>Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, straight lines, light rays</p>	Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils	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	
Famous Scientists					
<p>Carl Linnaeus (Identifying, Naming and Classifying Organisms)</p>	<p>Thomas Young (Wave Theory of Light)</p> <p>Ibn al-Haytham (Alhazen) (Light and our Eyes)</p>	<p>Charles Darwin and Alfred Russel Wallace (Theory of Evolution by Natural Selection)</p> <p>Jane Goodall (Chimpanzees)</p>	<p>Justus von Liebig (Theories of Nutrition and Metabolism)</p> <p>Sir Richard Doll (Linking Smoking and Health Problems)</p> <p>Leonardo Da Vinci (Anatomy)</p>		
Prior Learning					
<p>Year 5 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>Year 4</p>	<p>Year 3 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>Year 3 Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat.</p>	<p>Year 4 Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. Construct and interpret a</p>		

	<p>Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p> <p>Know and label the features of a river</p> <p>Recognise that environments can change and that this can sometimes pose danger to living things.</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 a solid object.</p> <p>Find patterns in the way that the sizes of shadows change.</p>	<p>Know how nutrients, water and oxygen are transported within animals and humans. Know about the importance of a nutritious, balanced diet.</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement: Know about the skeletal and muscular system of a human.</p>	<p>variety of food chains, identifying producers, predators and prey.</p> <p>Year 5</p> <p>Know the life cycle of different living things, e.g. Mammal, amphibian, insect bird.</p> <p>Know the differences between different life cycles.</p> <p>Know the process of reproduction in plants.</p> <p>Know the process of reproduction in animals.</p>		
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