Park Road CP School.

Long term progression overview.

Subject: Science

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
Early Years	<u>Autumn 1:</u>	• To know that babies are humans and need looking after. • To know about me and my family.	• To explore the natural world around them, making observations and drawing pictures of animals and plants. • To describe what they see, hear and feel while they are outside. •	• To understand changes in the natural world around such as seasons. • To understand that some animals hibernate.	
	<u>Autumn 2:</u> Assessment: Shelter	• To know that brushing our teeth keeps us healthy. • To know that doctors, dentists and nurses keep us healthy. • To know that vets keep animals healthy.	• To create seasonal pictures – autumn collage. • To create bark rubbings.	• To understand what it means to be healthy.	•
	<u>Spring 1:</u> Assessment: Bears – Identify senses	• To know the five senses. • To know what a habitat is. • To know the North and South Poles have ice and snow. • To know about bears.	• To describe what they can see, hear and feel outside. • To make comparisons between where we live and other places to live. • To make dens for bears in a forest environment.	• To understand that animals have different habitats.	•

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	Spring 2: Assessment: Senses walk	• To know that Spring brings warmer weather. • To know a life cycle of a tomato. • To know archaeologists' dig with dinosaur bones. • To know dinosaurs lived millions of years ago. • To know some facts about space.	• To observe changes in the environment such as daffodils growing. • To make observations of spring. • To plant seeds. • To name different dinosaurs.	• To understand that some animals come out of hibernation.	
	Summer 1: Assessment: Scavenger sort	• To know the life cycles of different animals such as a butterfly, frog and chicken. • To know what we might take on holiday using the home corner. • To know the importance of healthy foods. • To know ways to keep healthy.	• To plant seeds. • To go pond dipping and make observations. • To create observational drawings of fruit, vegetables and plants.	• To understand that a habitat is where an animal lives. • To understand how to manage basic hygiene. • To understand ways to look after the environment. • To understand how a chicken grows.	
	Summer 2: Assessment: Mixing materials	• To know ways to keep healthy. • To know the life cycles of different animals such as a butterfly, frog and chicken.	• To go pond dipping and make observations. • To participate within forest school.	• To understand how to manage basic hygiene. • To understand ways to look after the environment.	
Year 1.	Autumn 1: Who am I? (Animals including humans) Working scientifically: Observe closely, using	• To know the similarities and differences between human and other animals' skeletons, e.g. legs, skull, backbone, fins, neck.	• To label different parts of the body. • To identify different body parts such as arm, legs and spine.	• To understand the function of the five senses. • To understand why our eyes are important.	**Strand 1** Humans animals body **Strand 2**

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	simple equipment. Identify and classify. Gather and record data to help in answering questions Type of enquiry – Comparative and fair testing Assessment: Who am I? WS: Use observations and ideas.	• To know the different body parts of the human body. • To know that humans have five senses. • To know that we use our noses to smell. • To know that we taste using our mouth. • To know that we see using our eyes and this is the sense of sight. • To know that the senses of smell and taste are very closely linked. • To know touch as one of the five senses and that we use our hands to find out what things are like. • To know we hear with our ears.	• To identify different organs of the body such as heart. • To use measurements and make comparisons between heights. • To create a human graph with members of the class comparing heights. • To create a smell pot and offer reasons as to what makes the smell. • To record data using a tally chart. • To identify different tastes such as sweet, sour and bitter. • To record data using a pictogram. • To label the different parts of the hand such as fingers, fingernails, thumb and palm. • To distinguish between different sounds.	• To understand which parts of my body I use for different activities.	Ankle backbone cheek ear lobe elbow eye socket feet hips joints nails neck ribs thigh tongue vertebrae wrist **Strand 3** Identify Name Describe Compare Draw Label
	Autumn 2: Celebrations (Materials) Working scientifically: Observe things using simple equipment. Identify and classify. Perform simple tests. Use observations and ideas to suggest	• To know which part of the body is associated with each sense. • To know different sources of light. • To know that opaque materials create shadows. • To know that hard materials can make a sound.	• To make observations of a candle and ask questions. • To sort objects into two groups: sources of light / not sources of light. • To create a dark area and to find out what objects can be seen within the dark.	• To understand that without light we cannot see. • To understand that sound is made through vibrations.	**Strand 1** object material **Strand 2** candle dark eat food light light source

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	answers to questions. Gather and record data to help in answering questions. Type of enquiry – Identifying and classifying. Assessment: Test reflectiveness WS: Identifying and classifying.	• To know that fruits and vegetables come from plants.	• To create shadows with objects within the classroom. • To choose materials based on their properties. • To create a drum using different materials. • To classify different fruits and vegetables.		loud music opaque plant quiet shadow sound translucent transparent vibrate **Strand 3** Say Distinguish between Identify Describe Perform Observe Identify Classify Gather Record Use information
	Spring 1: On safari (Animals including humans) Working scientifically: Ask simple questions and recognise that they can be answered in different ways. Observe closely, using simple equipment. Perform simple tests. Identify and classify.	• To know that a vertebrate has a backbone and invertebrates do not have a backbone.	• To identify invertebrates in the local environment. • To use hand lenses to make observations. • To use scientific language such as head, habitat and shell when describing invertebrates. • To make comparisons between humans and invertebrates. • To identify and classify invertebrates.	• To understand that animals including humans use their senses to make sense of the world around them.	**Strand 1** animals humans skeletons **Strand 2** abdomen animal antennae body exoskeleton food chain habitat

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	Gather and record data to help in answering questions Type of enquiry – Pattern seeking Assessment: Nature spotters WS: Review identifying and classifying.		• To create questions to ask about invertebrates such as 'Are snails born with shells?'		head insect invertebrate legs move observe thorax vertebrate **Strand 3** Name Identify Describe Compare Ask Identify Classify Gather Record Use information
	Spring 2: Polar places (Animals including humans and materials) Working scientifically: Ask simple questions and recognise that they can be answered in different ways. Perform simple tests. Identify and classify. Use their observations and ideas to suggest	• To know properties of materials for clothes such as warm, waterproof and strong. • To know that polar explorers need clothing that will keep the body warm. • To know that animals which live in the polar regions have special features to help them survive. • To know which animals live in polar regions.	• To make comparisons between different regions of the world such as polar, rainforest and deserts. • To classify objects that would be useful for a polar region. • To classify materials which would keep us warm on a polar expedition. • To carry out a fair test into which gloves are warm, waterproof and flexible. • To research a polar animal.	• To understand that warm clothes are essential for a colder climate. • To understand that humans cannot live in polar regions without specialist clothes and food. • To understand that some animals use camouflage so they cannot be seen.	**Strand 1** animals ice snow material hot warm cold **Strand 2** habitat polar arctic Antarctic freeze

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	answers to questions. Type of enquiry – Research Assessment: Waterproof materials WS: Ask simple questions	• To know similarities and differences between animals in the polar regions. • To know what a herbivore, carnivore and omnivore are. • To know that explorers on polar expeditions take food that is good for them.	• To identify and classify animals into herbivores, omnivores and carnivores. • To make observations about what changes happen to ingredients when they become hot. • To identify common animals that are herbivores, carnivores and omnivores.		frozen carnivore omnivore herbivore animals birds reptiles mammals amphibians waterproof flexible **Strand 3** Identify Name Describe Compare Group Ask Perform tests Identify and classify
	Summer 1: Plants and animals Working scientifically: Ask simple questions and recognise that they can be answered in different ways. Observe closely, using simple equipment. Perform simple tests. Identify and classify. Use their observations	• To know the names of plants found in our local environment. • To know that birds have different features such as different size of beaks. • To know and name a variety of common UK pets. • To know a variety of UK mammals, birds, reptiles, fish and amphibians.	• To sort plants from the local environment using different criteria such as size or shape. • To identify and describe a variety of trees. • To label different parts of a tree. • To make observations of trees through pictures, sketches and bark rubbings. • To classify leaves and decide whether they have	• To understand the difference between a coniferous and a deciduous tree.	**Strand 1** Flower plant animal tree **Strand 2** amphibians animal birds carnivore deciduous coniferous fish

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	and ideas to suggest answers to questions. Gather and record data to help in answering questions. Type of enquiry – Identifying and classifying Assessment: Plant structure WS: Observe closely		come from a deciduous or coniferous tree. • To collect data using a tally chart. • To create a bird feeder using our knowledge of the features of birds. • To sort animals into groups: birds, reptiles, mammals, fish and amphibians		flowers habitat herbivore mammal omnivore plant reptile stem **Strand 3** Identify Name Describe Compare Ask Observe Perform tests Identify and classify Gather and record Use Suggest answers
	Summer 2: Holidays Working scientifically: Ask simple questions and recognise that they can be answered in different ways. Observe closely, using simple equipment. Perform simple tests. Identify and classify. Use observations and	• To know items are made from particular materials such as plastic can be used as it is waterproof. • To know that the sun can damage the skin and suncream must be used. • To know which materials would keep a frozen water bottle frozen. • To know sunglasses are important since they help to filter out the Sun's harmful rays and	• To classify objects which are needed for a beach holiday. • To investigate the best way to keep the plastic bottles of cold water cool on a sunny, hot day at the beach. • To use test results to make links to observations. • To apply knowledge of materials to make a pair of sunglasses.	• To understand that we should never look at the Sun and they should use sunglasses to protect their eyes. • To understand that litter can cause animals harm.	**Strand 1** animals holidays beach seaside sea sun **Strand 2** animal beach crab fish habitat

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	ideas to suggest answers to questions. Gather and record data to help in answering questions. Type of enquiry – Identifying and classifying Assessment: Animal identification WS: Identify and classify	they reduce the brightness, which makes it easier to see in very sunny conditions. • To know seashells are the hard, protective outer layer created by an animal that lives in the sea	• To classify animals into invertebrates, fish, birds and mammals. • To identify common animals that are herbivores, carnivores and omnivores. • To research a marine animal. • To identify and classify litter into groups such as plastic, wood, glass, metal and cloth.		litter pollution rock pool rubbish sea shore shell sunglasses sun screen sunburn **Strand 3** Name Identify Describe Compare Distinguish between Group together Ask questions Use observations Suggest answers
	Seasonal change Assessment: Seasonal change WS: Use observations over time	• To know that the weather is always changing and that we have many different types of weather. • To know that there are four seasons in the UK. • To know some of the ways humans adapt to the different seasons, e.g. by what we wear, eat and do. • To know that some foods are seasonal.	• To name the months each season occurs in. • To identify the main features of each of the different seasons. • To describe different clothing that is appropriate to wear during each season. • To identify differences between each of the four seasons. • To describe how animals are affected by each of the four seasons, and how		

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		• To know that the number of hours of daylight changes throughout each of the four seasons. • To know that there are more hours of sunlight during the summer than during the winter.	their behaviour changes during each one.		
Year 2.	Autumn 1: Healthy me Working scientifically: Observing closely, using equipment Using their observations and ideas to suggest answers to questions Gather and record data in answering questions Type of enquiry – Identifying and classifying Assessment: Taste test WS: Gather and record data	• To know that we need to take care of our body and our minds. • To know that it is important to eat a healthy balance of foods because different foods are useful to our bodies for different things. • To know that exercise keeps our hearts healthy, strengthens our muscles in different parts of the body, helps to keep us flexible and makes us feel good. • To know that we need food to live, grow, be active and stay healthy.	• To design an exercise to work my whole body using different apparatus. • To participate in exercise challenges. • To gather data and explain what this data means. • To classify foods into criteria such as healthy and not healthy. • To create a pictograph to show favourite types of foods. • To plan and make a healthy snack.	• To understand that exercise is important for our bodies to stay healthy.	**Strand 1** food healthy unhealthy exercise **Strand 2** air disease exercise food germs healthy hygiene hygienic **Strand 3** Describe Identify Compare Observe Gather and record Perform tests Use observations Suggest answers

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	Autumn 2: Materials – Squash, bend, twist, stretch Working scientifically: Identifying and classifying Observing closely Perform simple tests Using their observations and ideas to suggest answers to questions Gather and record data in answering questions Type of enquiry – Comparative and fair testing Assessment: Materials hunt WS: Gather and record data	• To know that some materials can change shape permanently, some can change shape and go back to their original shape, and some can't change shape. • To name a variety of materials that can change shape, can change shape temporarily and cannot change shape.	• To experiment with what happens to different materials when you bend, twist, stretch and squash them, recording my observations. • To create a sequence to change their body shape, call out squash, stretch, bend or twist. • To sort objects that can be squashed, bent, twisted and stretched. • To carry out tests into the properties of materials and record data numerically. • To create a model by squashing, bending, twisting and stretching.	• To understand the need to use a push (force) when squashing, whereas when stretching something a pull (force) is needed. • To understand how the material it is made from allows it to be squashed, bent etc.	**Strand 1** material opaque shadow translucent transparent vibrate **Strand 2** bend direction force move pull push squash squeeze stretch twist **Polysemous** bend force pull push **Strand 3** Find out Observe Perform Identify and classify Use observations Suggest answers Gather and record

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	Spring 1: Materials – Materials monster Working scientifically: Perform simple tests Identifying and classifying Observing closely, using equipment Using their observations and ideas to suggest answers to questions Type of enquiry – Identifying and classifying Assessment: Boat materials WS: Make comparisons and perform simple tests	• To know particular uses of everyday materials. • To know that the same product, e.g. a table, can be made from a variety of different materials, and can suggest suitable materials for each object. • To know that some materials can be both bent and twisted. • To know that some materials e.g. metal can be bent and sometimes be rigid and not be able to be bent.	• To use a range of appropriate vocabulary to describe the properties of different. • To identify and classify materials according to their properties. • To make comparisons between different materials using their senses, such as it cold to touch? • To suggest appropriate materials for an object to be made from, based on what the object will be used for and who will use it.	• To understand different ways of sorting materials based on their properties and characteristics. • To understand why some materials are unsuitable for objects.	**Strand 1** Material opaque shadow translucent transparent vibrate **Strand 2** bend fabric flexible material metal opaque plastic properties rock shiny squash stretch translucent transparent twist wood metal plastic glass brick paper cardboard rigid **Strand 3** Identify Compare

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					Find out Observe Perform Identify and classify Use observations Suggest answers Gather and record
	Spring 2 and Summer 1: Plants Working scientifically: Ask simple questions Identifying and classifying Observing closely Perform simple tests Using their observations and ideas to suggest answers to questions Gather and record data in answering questions Type of enquiry – Observation over time Assessment: Plant growth WS: Observe closely	• To know ways to identify different plants such as leaves, colours and petals. • To know that different seeds grow into different plants. • To know that the term 'germination' refers to the process when a seed starts to grow and produce shoots. • To know different parts of a plant. • To know that some plants grow from bulbs. • To know that the bulb provides a store of food for the plant while it is in the ground during the winter months. • To explain the life cycle of a plant grown from a bulb, such as a tulip.	• To identify common plants within our school grounds. • To carry out an experiment to observe how the roots of a bulb grow. • To use information on a seed packet to tell me when a seed should be planted, how to plant it and how to care for the seed as it grows into a plant. • To follow the instructions on a seed packet to plant a seed. • To ask questions about different seeds and plants. • To plan and set up an experiment to find out which conditions are best for seed germination. • To suggest how to make an experiment a fair test. • To use the results of my experiment to draw a diagram explaining the	• To understand what different gardening tools can be used for. • To understand that plants need water, light and a suitable temperature to grow. • To understand that seeds need water, oxygen, and the right temperature to germinate.	**Strand 1** Green spread plants **Strand 2** bulbs germinate germination grow light plants seeds temperature water **Strand 3** Observe Describe Find out Ask Observe Perform Identify and classify Use observations Suggest answers Gather and record

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			best conditions for seed germination. • To use observation to explain how a seed changes over time. • To carry out a comparative test to investigate what plants need to grow. • To make recyclable plant pots out of a range of materials. • To describe the similarities and differences between observations of seeds growing and bulbs.		
	Summer 2: Our local environment (Living things and their habitats) Working scientifically: Identifying and classifying Observing closely Perform simple tests Using their observations and ideas to suggest answers to questions Gather and record data in answering questions Type of enquiry – Identifying and classifying	• To know the difference between things that are living, things that are dead and things that have never been alive. • To name the seven life processes that all living things need to be able to do to stay alive. • To know that all living things will eventually die. • To know that a habitat is where an animal lives which supports them to live. • To know that micro-habitats provide food and shelter that animals need to live there.	• To classify things that are living, things that are dead and things that have never been alive. • To explore and observe micro-habitats in the local environment. • To identify and classify plants and animals in their habitats in the local environment. • To record data using a tally chart. • To experiment with ways of separating a variety of materials from water, choosing suitable equipment for the task. • To suggest what type of animals might live in a	• To understand that all living things need to live in a habitat that can provide them with the things they need to stay alive. • To understand that a micro-habitat is a very small habitat with plants and animals living there. • To understand that plants make their own food using the sun.	**Strand 1** Animal human plant alive dead Hot warm cold **Strand 2** animal carnivore dead difference food chain habitat herbivore living micro-habitat

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	Assessment: Woodlice habitat WS: Gather and record data	• To know that the plants and animals in a habitat are all dependent on each other for survival. • To know that plants and animals in a habitat are linked to each other through food chains	variety of different habitats. • To construct some simple food chains for a variety of habitats.		omnivore plants predator prey **Polysemous** difference living **Strand 3** Explore Compare Identify Describe Name Ask Observe Perform Identify and classify Use observations Suggest answers Gather and record
Year 3	Autumn 1: Rocks and Fossils Working scientifically: Ask relevant questions and use different types of scientific enquiries to answer them. Type of enquiry – Identifying and classifying	• To know the key properties of rocks and vocabulary to describe them. • To know some rocks can be permeable; they let water soak through them. Rocks that do not let water through are called impermeable. • To know what soil is made up of and explain why the soil is in layers.	• To classify sweets based on key properties. • To classify rocks based on Friedrich Mohs' scratch test scale. • To set up a comparative test to test and group rocks into permeable and impermeable. • To use observation to explore different soil samples and rank them	• To understand why soil is so important to our planet. • To understand how sedimentary rocks are formed. • To understand how igneous rocks are formed. • To understand how metamorphic rocks are formed. • To understand how fossils are formed.	**Strand 1** rock Stone pebble hard soft soil **Strand 2** crystals extinct fossil

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	Assessment: Reporting on rocks WS: Reporting on findings	• To know there is air and water in soil. • To know that the three main types of soil are clay, sand and silt. • To know that igneous, sedimentary and metamorphic rock can change over millions of years in a process known as the rock cycle. • To know that a fossil is the petrified remains of plants and animals from more than 10,000 years ago. • To know that a palaeontologist is a scientist who studies fossils. • To know that some fossils are common, and some fossils are very rare.	according to different criteria. • To research Mary Anning. • To make a mould fossil and explain how fossils are formed. • To classify fossil samples according to various criteria	• To understand that the softest rock can be scratched by all the other rocks; the hardest one cannot be scratched. • To understand why soil is important.	humus igneous impermeable magma metamorphic mineral palaeontologist palaeontology permeable rock sediment sedimentary soil **Strand 3** Compare Group Describe Recognise Ask Set up Make observations Take measurements Report Gather Record Classify Present
	Autumn 2: Humans and Animals Working scientifically: Gather, record, classify and present data in a variety of ways to help	• To know that animals, including humans, get the nutrition they need from what they eat. • To know that the two main reasons humans need food is for growth and energy.	• To classify a variety of foods into different food groups. • To carry out my own research to find out which foods different animals eat and record my findings. • To generate questions to	• To understand the links between high sugar content and health. • To understand how to eat a healthy, balanced diet. • To understand how bones protect the body, keep us	**Strand 1** human pull move **Strand 2** balanced biceps

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	in answering questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar graphs and tables. Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Type of enquiry – Research – Research into food types. Assessment: Investigating the human skeleton WS: Record findings	• To know that starches, fats and sugars are good foods for energy. • To know that we have skeletons to support our bodies, protect our internal organs and to help us move. • To know some of the major bones in the human body. • To know that all vertebrates have a backbone. • To know that we need muscles to help us move.	investigate to find out what pets eat. • To gather data in a tally chart and convert the results into a bar graph. • To use data to draw conclusions and find the answer to my question. • To label a diagram of the human skeleton. • To make different movements with my body and explain which muscles I am using.	upright and help us to move.	carbohydrates contract diet exoskeleton femur humerus joint muscle nutrients protein relax skeleton triceps vertebrate **Polysemous** pull Balanced diet **Strand 3** Identify Gather Record Classify Present Record Report
	Spring 1: Light and shadows Working scientifically: Set up simple practical enquiries, comparative and fair tests.	• To know that we need light in order to see. • To know that darkness is the absence of light. • To know a variety of natural and man-made light sources.	• To apply knowledge of light and darkness and create a dark area. • To experiment with mirrors and reflections. • To sort materials into groups: opaque,	• To understand why some materials show a reflection and why some don't. • To understand that opaque objects will cast a shadow, translucent	**Strand 1** Light dark sun lightbulb shadow

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	Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment including thermometers and data loggers. Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Type of enquiry – Pattern seeking Assessment: Can everything make a shadow? WS: Gather and record data.	• To know that shiny surfaces reflect light better than dull surfaces. • To know that shadows are formed when light is blocked by an object. • To know the difference between transparent, translucent and opaque objects.	transparent and translucent. • To investigate how shadows behave, finding ways to make shadows move and make them longer and shorter. • To draw conclusions from my shadow investigation to say what I have found out.	objects will cast a faint shadow, and transparent objects will not cast a shadow. • To understand that shadows get bigger when an object is close to the light source and get smaller when an object is far away from the light source.	see **Strand 2** description dull explanation light source mirror observation opaque reflect shadow shiny translucent transparent **Strand 3** Recognise Notice Find patterns Set up Make observations Report Draw conclusions Make predictions

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	Spring 2: Forces and Magnets Working scientifically: Ask relevant questions and use different types of scientific enquiries to answer them. Set up simple practical enquiries, comparative and fair tests. Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment including thermometers and data loggers. Gather, record, classify and present data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	• To know that a force is a push or a pull on an object, and that a force needs two objects where one pushes or pulls the other to make it move. • To describe whether a push or a pull is being used to move an object, and describe which direction the forces are acting in. • To know that some forces, like gravity and magnetism, do not need contact between two objects to make things move. • To know that magnets have a north pole and a south pole that always attract each other.	• To carry out a fair test to explore whether objects need the same force to move them across different surfaces. • To make predictions about the results of my investigation. • To use my results to draw conclusions. • To predict which materials will be magnetic and which will not, then test my hypothesis. • To explore magnetism and a variety of materials. • To explore whether magnets attract or repel when north poles and south poles are put together. • To carry out my own research to find out about uses for magnets and report my findings.	• To understand lots of different uses for magnets. • To understand that some forces need contact between two objects. • To understand that magnetism is a non-contact force.	**Strand 1** Push pull twist strong weak **Strand 2** attract compass contact iron magnet magnetic north non-contact non-magnetic pole prediction repel **Polysemous** pull Push attract iron repel **Strand 3** Compare Notice Observe Group Describe Predict Ask

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	Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Type of enquiry – Identifying and classifying Comparative and fair testing Assessment: Testing the strength of magnets WS: Comparative and fair test				Set up Make observations Take measurements Report Gather Record Classify Present Make observations Draw conclusions
	Summer 1: Plants Working scientifically: Ask relevant questions and use different types of scientific enquiries to answer them. Set up simple practical enquiries, comparative and fair tests. Make systematic and careful observations and, where appropriate, take accurate measurements using	• To know and describe the functions of the roots, stem, leaf and flower of flowering plants. • To know that the root is the first part of the plant to grow from the seed and that the young root absorbs water and minerals from the soil to help the seed sprout. • To know each step in the growth of roots. • To know what seeds need to germinate. • To know that the plant uses minerals from the	• To identify plants within the local environment. • To create observational drawings of different plants within the environment. • To grow a seedling and annotate a pressed seedling. • To set up a comparative test to investigate the way in which water is transported within plants. • To carry out fair tests over a period of time and record my observations in a table.	• To understand and describe the process of water transportation in plants. • To understand and explain what the process of photosynthesis is. • To understand some of the ways pollen grains get from the male stamen to the female part of the plant.	**Strand 1** bulbs germinate germination grow light plants seeds temperature water **Strand 2** carpel flower geminate leaves life cycle nutrients

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	standard units, using a range of equipment including thermometers and data loggers. Gather, record, classify and present data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Identify differences, similarities or changes related to simple	soil to make chlorophyll in its leaves. • To know pollination is the transferring pollen grains from the male anther of a flower to the female stigma so that new plants can be made. • To know the ways in which a variety of different plants disperse their seeds.	• To dissect a flower and identify the parts. • To gather data about plants within the local environment.		ovary ovule petal photosynthesis pollen pollination root root hairs seed dispersal sepal stamen stem style stigma veins **Strand 3** Identify Describe Explore Investigate Ask Set up Make observations Gather, record, classify, present Report Draw conclusions Make observations Suggest improvements Identify Use evidence to answer questions

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	scientific ideas and processes. Use straightforward scientific evidence to answer questions or to support their findings Type of enquiry – Observation over time Assessment: Observation of plants WS: Make observations.				
	Summer 2: The Nappy Challenge Working scientifically: Working scientifically unit Type of enquiry – Pattern Seeking Assessment: Who am I? WS: Plan different types of enquiry	• To know a variety of materials which disposable nappies are made from.	• To explore the materials that a disposable nappy is made from. • To set up and carry out a fair test. • To ask questions based on previous knowledge. • To test nappies to investigate which is the most absorbent. • To carry out a fair test into which nappy stretches the furthest. • To use data to draw conclusions. • To gather data through research. • To create a nappy using a variety of materials.	• To understand which materials are used to make disposable nappies.	**Strand 1** materials investigate waterproof **Strand 2** absorb absorbent cloth cotton disposable elastic faeces liquid material nappy plastic properties urine velcro waterproof wood pulp

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
					Strand 3 Make observations Take accurate measurements Gather, record, classify and present data Ask relevant questions Use results Draw simple conclusions Make predictions Set up Use evidence Answer questions
Year 4	Autumn 1: States of matter Working scientifically: Using scientific evidence to answer questions or to support their findings. Type of enquiry – Observation over time Assessment: Making ice cream WS: Make observations	• To know a material may exist in three states: solid, liquid, and gas • To know the difference between a liquid and a solid. • To know how to tell if a material is a liquid or a solid. • To know that gases have mass. • To know that solids, liquids and gases behave differently because the particles of each behave differently. • To know that water turns from a liquid to a solid at 0°C and from a liquid to a gas at 100°C. • To know that metals all have different melting points and that these are	• To describe the properties of a solid, liquid and gas. • To compare and classify materials according to whether they are solids or liquids. • To explain how evaporation and condensation are part of the water cycle. • To use thermometers to take temperatures • To record temperatures within graphs accurately • To research the melting points of a variety of materials. • To plan and carry out an experiment to see the different melting points of chocolate and evaluate the fairness of my experiment.	• To understand what would happen if a solid, liquid and gas were poured into a container. • To understand how the ice-cream as a solid can be reversed to become a liquid and then the process reversed again to become a solid. • To understand liquids can be frozen to become solids and then can melt to become liquids again. These are reversible changes.	**Strand 1** Heat cool frozen melting water ice steam material **Strand 2** boiling boiling point condense condensation condensing evaporate evaporation freeze freezing point gas liquid matter

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
		usually very high temperatures. • To know that the process of a liquid turning into a gas is called evaporation. • To know that the process of a gas cooling and turning into a liquid is called condensation.	• To plan and carry out making of ice cream to investigate freezing. • To create a plastic bag water cycle and show what is happening. • To draw diagrams and use written examples to show the processes of evaporation and condensation.		material melting melting point solid temperature thermometer water cycle **Strand 3** Compare Group Observe Identify Ask Set up Gather, record, classify and present data Record findings Make observations Draw conclusions Report Make predictions Identify Use evidence
	Autumn 2: Electricity Working scientifically: Setting up simple practical enquiries, comparative and fair tests. Using results to draw simple conclusions, make predictions for	• To know mains-operated equipment will have a plug, whereas purely battery-operated appliances won't. Batteries can be used in smaller, portable appliances. • To know the word 'voltage' is used as an indication of the energy	• To use diagrams to explain which circuits will and won't work. • To distinguish between objects that use mains electricity and those that use battery-powered electricity. • To collate data through a tally chart and record this into a graph.	• To understand the difference between static electricity and current electricity. • To understand some of the ways in which people can stay safe when using mains electricity. • To understand why some appliances are made with conductors on the inside	**Strand 1** danger electricity wire **Strand 2** appliances battery bulb buzzer cell

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
	new values, suggest improvements and raise further questions. Type of enquiry – Comparative tests Assessment: Electricity WS: Setting up enquiries	available from a supply of electricity. • To know that current electricity needs a complete circuit in order to work properly. • To know a definition for the words 'conductor' and 'insulator'. • To know that metals are conductors and non-metals are insulators • To know how switches work to complete a circuit.	• To create citrus fruit batteries and test them within a circuit • To test different materials using a simple circuit to see whether they are conductors or insulators. • To classify objects into those that are conductors and those that are insulators. • To experiment with a variety of objects and materials in a simple circuit to create a working switch.	and insulators on the outside. • To understand that when a switch is closed the electricity can flow through, and when it is open the electricity cannot flow and the light or appliance will not work. • To understand conductors are materials like metal which conduct electricity. • To understand that insulators don't conduct electricity.	circuit components electricity conductor insulator mains metal rechargeable series circuit switch terminal **Polysemous** switch terminal **Strand 3** Identify Construct Recognise Ask Gather Record Classify Present Draw
	Spring 1: Sound Working scientifically: Ask relevant questions and use different types of scientific enquiries to answer them. Make systematic and careful observations	• To know that objects that make a sound are called 'sources of sound. • To know that a vibration is when something moves up or down, backwards and forwards, or from side to side quickly which makes a sound.	• To name a variety of musical instruments, describe what they sound like and explain how the sound is made. • To identify when the pitch and volume of a sound changes, and explain what has happened.	• To understand how the length, thickness and tightness of a string affects its pitch. • To understand how the length of the air column in wind instruments changes the pitch. • To understand with string telephones that the	**Strand 1** Instrument music noise ear hear **Strand 2** decibels pitch

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
	and, where appropriate, taking accurate measurements using standard units, using a range of equipment. Type of enquiry – Fair tests Assessment: String telephones WS: Ask relevant questions	• To know that sound travels through the air in waves and that sound waves are caused by vibrations in the air. • To know the bigger the vibration the louder the sound; the smaller the vibration the quieter the sound. • To know what the terms 'pitch' and 'volume' mean. • To know that sound waves pass through some materials more easily than others. • To know that sometimes sound needs to be muffled for safety or convenience. • To know that decibels are used to measure the volume of sound	• To investigate a range of objects that show visible vibrations to help me understand how sound waves work. • To create an instrument and investigate the pattern between vibrations and volume of sound • To create a guitar using recycled materials and change the volume and pitch of the sound. • To make predictions about the pitch and volume an instrument will produce, using my knowledge of how sound works. • Measure and record regularly the distance from the sound source and how the sound changes until they can no longer hear the sound, using a trundle wheel. • To conduct a fair test - Does the telephone work better if sound travels through a solid material like string or through the air in plastic tubes?	vibrations travel down the wool, or string from one cup to the other; the other person hears the sound. • To understand an insulator is a material that does not let sound vibrations pass through easily.	sound sound source vibrate vibration vibrating volume **Polysemous** pitch Volume **Strand 3** Identify Recognise Find patterns Ask relevant questions Set up Make observations Take accurate measurements Gather, record, classify and present data Record findings Report Draw conclusions Make predictions Identify Use evidence
	Spring 2: Teeth and digestion	• To know where canines, incisors and molars are in the human mouth.	• To classify a wide variety of animals to show whether they are	• To understand the function of canines, incisors and molars.	**Strand 1** eating food

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
	Working scientifically: Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. Type of enquiry – Identifying and classifying Assessment: Teeth in liquids WS: Record findings	• To know that teeth have roots that hold the teeth in place in the gums. • To know the outer layer of tooth is called enamel. It is one of the hardest substances in the body. • To know that young children have 20 milk teeth that start growing through when they are around six months old. • To know that milk teeth fall out and are replaced by 32 adult teeth, which are permanent. • To know that tooth decay can cause teeth to rot and fall out. • To know some ways of making sure my teeth stay healthy. • To know the organs associated with the digestive system. • To know the functions of the basic parts of the digestive system.	herbivores, carnivores or omnivores. • To suggest similarities and differences in the diets of a variety of different animals. • To identify herbivores, carnivores and omnivores in a variety of different habitats. • To interpret and construct a variety of food chains with both producers and consumers. • To set up an experiment over time to find out how drinks affect our teeth. • To identify human teeth and describe the purpose. • To label a diagram of the digestive system and describe how it works.	• To understand why different animals have different types of teeth. • To understand how the digestive system works and how parts are connected.	drink diet healthy teeth **Strand 2** anus canine carnivores decay digestion enamel energy herbivore incisor large intestine molar mouth nutrients oesophagus omnivore small intestine stomach **Strand 3** Describe Identify Construct Ask Set up Make observations Take measurements Report Gather Record

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
					Identify Present Make observations Draw conclusions Use evidence
	Summer 1: Habitats Working scientifically: Gather, record, classify and present data in a variety of ways to help in answering questions. Identifying differences, similarities or changes related to simple scientific ideas and processes. Type of enquiry – Pattern seeking Assessment: Local environment survey WS: Gather, record and classify data	• To know that animals with backbones and skeletons inside the body, are called vertebrates. • To know a definition for the term 'habitat'. • To identify animals that are vertebrates, invertebrates, mammals, birds, insects, fish, reptiles, amphibians, insects. • To know that changing just one thing in a habitat can have a big impact on all the organisms living there. • To know some of the ways in which humans can both help sustain environments and ways in which they harm environments.	• To classify a variety of organisms using my own and given criteria, sorting the results into tables and Carroll diagrams. • To use a classification key to identify which group an animal belongs to. • To use a classification key to identify unfamiliar organisms. • To classify living things within the school environment. • To produce a tally chart of the invertebrates identified in different habitats within the school environment. • To use numerical date to create a bar graph. • To identify and classify a variety of British plants.	• To understand why it is important to be able to classify organisms. • To understand why bees are important for the environment, and the dangers to bees.	
	Summer 2: Bridges Working scientifically unit	• To know bridges and towers can be made from many different materials such as wood, stone, bricks, iron and	• To create a beam bridge and suggest improvements. • To carry out a fair test to find out which shape is	• To understand that a triangle is the strongest shape. • To understand a wide base at the bottom and	**Strand 1** Danger electric wire

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
	Type of enquiry – Pattern seeking Assessment: Bridge engineers WS: Ongoing assessment	steel even plastic and glass fibre can be used. • To know the material a bridge is made from is important but so is the shape, a material can be made stronger by changing its shape	the strongest pillar for a bridge. • To use spaghetti and mini marshmallows to make the different shapes to carry out comparative tests to find out which one keeps its shape best. • To carry out a fair test into the strongest tower using paper. • To record data in a tally chart and use this to create a bar graph. • To research an animal and investigate how it has built its home.	triangles make a tower stronger.	**Strand 2** build bridge construct construction structure tower **Strand 3** Ask relevant questions Set up Make observations Take accurate measurements Gather, record, classify and present data Record findings Report Draw conclusions Make predictions Identify Use evidence
Year 5	Autumn 1: Forces Working scientifically Taking measurements, using a range of scientific equipment, with increasing accuracy and precision Type of enquiry - Comparative and fair testing	• To know that the Earth's gravitational force causes objects to have weight, and that gravity pulls objects towards the centre of the Earth. • To know that friction is the force that acts as resistance between two objects when moving over one another. • To know gravity is an attractive, non-contact force. It is measured in Newtons (N).	• To carry out an investigation to explore the effect of gravity on falling objects, taking careful measurements and observations to draw conclusions. • To suggest ways to plan an experiment to find out which surface has the most friction when an object is moved across it. • To carry out a fair test to explore the friction of different surfaces,	• To understand gravity works all over our Earth and also everywhere in the Universe. Without Earth›s gravity, we would fly off its surface • To understand the roles Newton and Galileo played in our understanding of gravity • To understand simple machines and they can help to change the size of the force, e.g. a small force on a hand whisk is	**Strand 1** push pull movement stop **Strand 2** air resistance force meter friction gravity newton magnetism reliable

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
	Assessment: Marble run WS: Take measurements	• To know that air resistance is the force that occurs when air pushes against a moving object, making it slow down. • To know that water resistance is the force that pushes against objects as they pass through the water. • To know that the shape of an object dictates how much water resistance it will meet as it moves through the water. • To know that pulleys and levers make heavy objects easier to lift and can explain why. • To know that gears allow a smaller force to have a greater effect. • To know that two or more gears working together are called a transmission. • To know that the force transmitted by gears in a transmission is called torque.	recording my results accurately and using them to draw conclusions. • To plan, set up and carry out an investigation to explore how the size of a parachute affects the speed at which it falls to the ground, recording my results appropriately and using them to draw conclusions. • To make predictions about which shape of plasticine would fall quickest in a pot of water, giving scientific explanations for my choices. • To create some simple pulleys, exploring the different forces needed to pull the same object and drawing conclusions from my findings. • To create a lever, recording different masses, transferring data to a line graph	changed into a bigger force to whisk food	resistance weight **Polysemous** pull Push **Strand 3** Explain Identify Recognise Plan Take measurements Use test results Make predictions Report Present Identify
	<u>Autumn 2: Materials – reversible and irreversible</u>	• To know reversible changes do not produce a new substance or	• To identify a range of mixing processes, dissolving processes or changes of state that are	• To understand what would happen to a variety of materials when they were heated and cooled	**Strand 1** materials changes

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
	Working Scientifically: Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Use test results to make predictions to set up further comparative and fair tests. Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in	change the amount of a substance. • To know that reversible changes include liquid water to ice to liquid water • To know irreversible (chemical) changes do produce new substances • To know that dissolving is a reversible change. • To know that an irreversible change occurs when two materials react with each other to form a new substance. • To know that some materials change state when they are heated or cooled. • To know that when a material is burned, it produces a new product (e.g. gas or ash), which makes burning an irreversible change.	reversible. • To mix a variety of materials with water to see whether they will dissolve, float, sink or react, recording the results in a table. • To investigate different irreversible changes by mixing different materials together, observing the results and explaining what has happened. • To inflate a balloon using a mix of vinegar and baking soda	and explain whether these are reversible or irreversible changes. • To understand the changes that resulted from the mixing of vinegar and warm milk to form a new material. • To understand that many scientists research ways to make new materials that can help people to solve problems and make life easier. Without these new materials, we would not have many of the things we use today, from computers to trainers	**Strand 2** acid burning irreversible material reaction reversible rust **Strand 3** Demonstrate Explain Plan Take measurements Use results Make predictions Record Report Present Identify

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
	results, in oral and written forms such as displays and other presentations. Identify scientific evidence that has been used to support or refute ideas or arguments. Type of enquiry - Comparative and fair testing Assessment: Dissolving WS: Plan scientific enquiry				
	Spring 1: Earth and space Working scientifically Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments. Take measurements, using a range of scientific equipment, with increasing accuracy and precision.	• To know that the Sun, Earth and Moon are roughly spherical in shape. • To know that Earth orbits the Sun and the Moon orbits the Earth. • To know how the rotation of the Earth creates night and day. • To know that as well as orbiting the Sun, the Earth rotates on its axis, and that it takes one full day (24 hours) for a complete rotation. • To know that the tilt of the Earth's axis is what	• To describe what the Sun, Earth and Moon are using appropriate vocabulary. • To describe why the length of daylight changes throughout the year • To describe why the Moon appears to change shape throughout a lunar month. • To describe the different phases of the Moon using appropriate vocabulary. • To describe what a solar eclipse is and why it occurs • To create a model of the solar system	• To understand why there are different time zones in the world. • To understand how theories about our solar system have changed over time, explaining the difference between geocentric and heliocentric models.	**Strand 1** Planets space Earth stars astronaut rocket **Strand 2** daytime geocentric heliocentric night-time orbit solar system star sun time zone

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
	Type of enquiry – Observation over time Assessment: Craters WS: Take measurements	causes the four seasons of the year. • To know that the Northern and Southern Hemispheres experience seasons at different times of year and can explain the reason for this. • To know that we are in a galaxy called the Milky Way. • To know that there are three main types of planets in our solar system and can describe the difference between terrestrial, gas giant and ice giant planets. • To know the planets in our solar system and order them by their distance from the Sun. • To know that the length of a year is different on each planet because of the time it takes each one to orbit the Sun.	• To refute ideas and theories using scientific knowledge • To make observations of Moon phases. • To carry out an investigation into Moon craters measuring width and depth		**Strand 3** Describe Use ideas to explain Plan Take measurements Record data and results Use test results Make predictions Set up Report and present findings Identify
	Spring 2: Materials Working scientifically Plan different types of	• To know electrical insulators allow electricity to pass through easily, and electrical insulators do	• To sort a range of materials • To investigate which material is the strongest carrier bag, recording data	• To understand that a mixture contains more than one substance. These are not chemically joined, which means they are easy to separate using	**Strand 1** Heat electricity material mix

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
	scientific enquiries to answer questions, including recognising and controlling variables where necessary. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Use test results to make predictions to set up further comparative and fair tests. Report and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as	not allow electricity to pass through easily. • To know a substance may dissolve in one liquid but not in another. • To know when a solid dissolves in a liquid it creates a solution • To know a solution is usually transparent, even if it's coloured • To know that some materials will dissolve in water to form a solution. • To know that not all materials react the same way when mixed with water; some will float, sink, dissolve or react. • To know that soluble materials, such as sugar, are able to be separated from water through evaporation. • To know that filtering is a good way to separate water from insoluble materials, such as sand.	in a table and converting to a line graph • To identify the properties of a variety of everyday materials, such as whether it is magnetic, conductive, soluble, flexible • To sort materials into thermal conductor or thermal insulator • To carry out a fair test into conductors and insulators recording data in a table • To plan and conduct an investigation into different materials such as which material is the most flexible? • To measure volume of water, weight of sugar and time taken to dissolve • To filter water through designing an investigation • To classify materials depending on whether they dissolve, float, sink or react when mixed with water.	their properties, e.g. size, magnetism and solubility. • To understand that filtering is different to sieving because the solids are mixed into a liquid, e.g. water. However, the solids have not dissolved into the water so can be separated using a physical barrier that lets the water through and leaves the small particles behind • To understand that there is always a limit to how much solid can dissolve in a given amount of water.	**Strand 2** dissolve elastic electrical conductor evaporate filter flexible hard insoluble mixture plastic resistant rigid soluble solution solvent thermal conductor **Strand 3** Compare Group Know Describe Use knowledge to decide Give reasons Demonstrate Explain Plan Take measurements Record data and results Use test results Make predictions Set up Report Present Identify

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
	displays and other presentations. Identify scientific evidence that has been used to support or refute ideas or arguments. Type of enquiry – Comparative testing Assessment: Insulation layers WS: Make predictions and set up further tests				
	Summer 1: Life Cycles Working Scientifically Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Type of enquiry - Research - life cycles of animals, Jane Goodall Identifying and Classifying - similarities	• To know flowers are the reproductive organs of a plant. They produce pollen and eggs, which then produce seeds. • To know Plants cannot pollinate their own flowers: they need to get their pollen to the flowers of another plant • To know asexual reproduction needs only one parent, unlike sexual reproduction, which needs two parents • To know the process of sexual reproduction in flowering plants, using	• To describe and compare the life cycles of a variety of mammals, reptiles, fish and other animals. • To label the parts of a flowering plant correctly using their scientific names. • To dissect a flower to explore the male and female parts of the plant. • To follow instructions to grow a new plant from cuttings. • To draw life cycles of different animals • To compare the life cycles of a variety of animals.	• To understand how and why humans clone plants. • To understand how the environment in which an animal lives affects the way it reproduces. • To understand that all animals grow from an egg. In insects, fish and amphibians, this egg is a ball of jelly and reptiles' eggs have leathery shells. The baby develops inside and then hatches when it is ready to come out. • To understand Mammals do start off as a tiny egg,	**Strand 1** Animals plants life death born grow alive **Strand 2** adolescence adolescent arthritis gestation period life expectancy puberty teenager

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
	and differences in life cycles. Assessment: Life cycle research WS: Research	each of these terms: petal, anther, carpel, filament, ovary, stamen, stigma, sepal and style. • To know the process of asexual reproduction in plants, giving some examples of plants that reproduce asexually. • To know the meaning of metamorphosis • To know that fertilisation occurs when a single sperm fuses with a single egg • To know that some animals reproduce externally, and others reproduce internally, giving examples for each. • To know life cycles of different animals such as hens, birds, frogs and butterflies • To know ways in which the life cycles of different animals might vary in different environments around the world.	• To carry out independent research to find out about the life and achievements of a famous naturalist. • To explain the contribution of some famous naturalists to our understanding of nature and the importance of humans looking after the environment.	but this egg stays inside the mother in a special area called the womb.	**Strand 3** Describe Report Present Record Plan
	Summer 2: Growing up/old Working scientifically Reporting and presenting findings	• To know that humans give birth to live young • To know some of the ways our bodies change as we grow.	• To name the different stages in the human life cycle and put them in order. • To create a bar chart to show the gestation period	• To understand the role of hormones in puberty. • To understand some of the ways teenagers can keep fit and healthy during all the	**Strand 1** baby toddler child teenager adult

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
	from enquiries. Record data and results of increasing complexity. Planning different types of scientific enquiries to answer questions Type of enquiry - Identifying and classifying Assessment: Growth survey WS: Take measurements and record data	• To know that our rate of growth is dependent on many different factors. • To know the stages in the gestation period of humans and compare this to other animals. • To know the growth and development of children from age 0 to 11. • To know puberty is the time when the body matures from that of a child to that of an adult • To know the changes that occur to both boys and girls during puberty. • To know that a human is fully grown by the time they reach the age of around 20. • To know that the human body starts to deteriorate as it enters old age. • To know some of the ways in which humans can make sure they stay fit and healthy as they get older.	of a range of animals and use this to answer questions. • To compare gestation periods in animals with the female animal's weight and use this to draw conclusions.	changes that take place during puberty. • To understand the human life span can be split into a number of stages: infancy, childhood, adolescence, young adulthood, adulthood and old age. The actual length of these stages varies across different cultures and time period	**Strand 2** reproduction female fertilisation gestation male ovary sperm **Strand 3** Describe Plan Take measurements Use test results Make predictions Report Present Identify
Year 6	Autumn 1: Animals including humans	• To know the circulatory system is made up of the heart, the lungs, blood	• To be able to record pulse accurately: Calculate bpm (beats per minute) – take	• To understand the function of the heart within the body	**Strand 1.** Blood veins heart

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
	Working scientifically: Taking measurements, using a range of scientific equipment, with increasing accuracy and precision taking repeat readings when appropriate, recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Type of enquiry – Observation over time Assessment: Heart rate poses WS: Measure and record	and the vessels it travels through • To know the function of the circulatory system is to transport nutrients, gases and wastes between the cells of the body and the digestive system, respiratory system and excretory system • To know that the arteries carry blood away from the heart while veins return blood to it, the veins have valves that only allow the blood to travel one-way so that the blood keeps moving in the correct direction. • To know blood is made of a watery yellow fluid called plasma that carries dissolved nutrients, hormones and proteins • To know that during exercise the heart rate and breathing rate increase to provide more oxygen to the muscles and to remove carbon dioxide • To know that some drugs are very beneficial, and others are very harmful,	pulse for 15 seconds multiply by four by 2 • To be able to use tests to make further predictions • To be able to plan scientific enquiries, controlling variables where necessary • To use a diagram of the human heart to suggest how it works. • To design an investigation to explore how exercise affects our heart rate and draw conclusions from my results. • To create presentations, from research, about drugs and the effects on the body	• To understand the impact of diet, exercise, drugs and lifestyle on the body • To understand how important the heart is for the body • To understand that regular exercise can lead to stronger muscles and bones • To understand and describe the importance of the different food groups and why each one is important for keeping our bodies healthy. • To understand To use food labels to match foods to their nutritional values • To describe the short-term and long-term effects of drugs such as tobacco and alcohol. • To make suggestions about the ways in which given characters can change their lifestyles to make them healthier.	lungs diet exercise food healthy water **Strand 2.** Addiction aorta Artery atrium capillaries carbon dioxide circulatory system oxygen pulse Vein respiration **Strand 3.** Identify Name Describe Recognise Plan Take measurements Use results Make predictions Record Report Present Identify

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
		and that some drugs are legal and some are illegal.			
	Autumn 2: Living things Working scientifically: Reporting and presenting findings from enquires, including conclusions, casual relationships and explanations of and a degree of trust in results , in oral and written forms such as displays and other presentations. Type of enquiry – Identifying and classifying Assessment: Growing yeast WS: Make predictions and report findings	• To know that the Linnaeus system uses Latin names for organisms so that there was a globally recognised naming system and to describe what each of the seven levels on the classification system are: kingdom, phylum, class, order, family, genus and species. • To know what a micro-organism is. • To know that micro-organisms can be classified into the kingdoms of protists, bacteria and fungi. • To know that micro-organisms can be harmful and non-harmful for the body • To know that the mould that grows on our food is also a type of fungus. Other single-celled fungi, such as yeast, ferment sugar and produce ethanol (alcohol) and carbon dioxide gas. They	• To classify a variety of organisms into groups according to their features. • To use a classification key to help me identify which group unfamiliar animals belong to. • To use a variety of criteria to classify animals that belong to the same group, e.g. mammals. • To create a classification key to help identify a variety of flowering and non- flowering plants. • To gather plant samples (or photographs of plants) from the local area, then create a classification key to identify them. • To find a variety of different ways to classify different plants. • To use the Linnaeus classification system to identify the kingdom, phylum, class, order, family, genus and species of a variety of organisms. • To use the Linnaeus classification system to	• To understand why it is important to be able to classify organisms. • To understand where bacteria can be harmful or helpful. • To understand why bacteria are not plants or animals and have a separate kingdom. • To understand how the Linnaean system has helped scientists classify living things	**Strand 1:** Plants animals flowers alive habitat **Strand 2.** amphibian bacteria classification fungi invertebrate kingdoms mammal microbe mould photosynthesis species vertebrate **Strand 3.** Describe Give reasons Classify Plan Take measurements Use results Make predictions Record Report Present

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
		are very important in making bread, as the gas causes bubbles in the dough and makes the bread rise. • To know the difference between flowering and non-flowering plants. • To know groups of organisms (plant, mammal, amphibian, reptile, bird, fish, insect, crustacean, arachnid or mollusc, as well as echinoderm, myriapod and annelid) • To know fungi are a separate system which reproduce using spores	answer questions about different organisms. • To carry out a fair test to explore which foods yeast most likes to eat, recording the results and drawing conclusions. • To create observational drawings of mushrooms and carry out a fair test to reproduce mushrooms using spores.		Identify
	<u>Spring 1 and 2:</u> Light <u>Working scientifically:</u> Reporting and presenting findings from enquires, including conclusions, casual relationships and explanations of and a degree of trust in results , in oral and written forms such as displays and other presentations.	• To know the different parts of the eye and describe their function. • To know that light can only travel in a straight line. • To know that the angle the light lands on the mirror will affect which angle the light changes direction to, and to know that this is called the angle of reflection. • To know the difference between a shadow and a reflection.	• To label a cross-section diagram of the human eye, explaining the function of each part. • To experiment with different materials to set up an investigation into how light travels. • To use arrows to draw the direction light travels. • To make predictions about which surfaces will reflect a lot of light and which won't.	• To understand that because light travels in straight lines, the edges of light beams are straight, and shadows are the same shape as the object casting them. • To understand how mirrors can be used to reflect light. • To understand how objects such as periscopes and rear-view mirrors work and why they are useful.	**Strand 1** Light dark shadow reflect see sun **Strand 2** Cornea Iris Lens Pupil Light ray Reflection refraction

Year Group	Area of Learning	Knowledge	Skills	Understanding	Vocabulary
	Use test results to make further predictions and comparative and fair tests. Type of enquiry – Comparative and fair testing Assessment: Recording shadows WS: Take measurements and record findings	• To know that when light passes from one material into another, it changes direction. The change in direction is known as refraction. • To know rainbows are formed through refraction, reflection and dispersion (when light is split into different colours)	• To suggest a variety of investigations to explore how shadows behave. • To carry out an investigation to explore what happens to the size and shape of a shadow when an object is moved further away from a light source, recording my results in graphs and tables. • To use mirrors to explore how they can see behind themselves and around corners. • To explore how to make rainbows using a torch and a prism.	• To understand that some surfaces reflect more light than others • To understand how a mirror could make a shadow and a reflection at the same time. • To understand what happens to the path of light as it travels through water and glass. • To understand that a rainbow is a spectrum of light.	mirror straight image **Strand 3** Recognise Use ideas to explain Explain Gather and record Plan Take measurements Use results Make predictions Record Report Present Identify
	Summer 1: Electricity Working scientifically: Planning different types of scientific enquiry to answer questions, including recognising and controlling variables where necessary Type of enquiry – Pattern seeking	• To know one battery is a cell and each cell has a voltage of 1.5 V. • To know key vocabulary:: circuit, current, conductor, insulator, volt, component, battery, motor. • To know that if there are too many volts running through a circuit, it will blow the component.	• To draw circuit diagrams using symbols correctly. • To create a circuit using a diagram. • To create a way of measuring the brightness of a bulb, for example, by using paper. • To explore how using resistance wire can change the brightness of a bulb, speed of a motor and sound of a buzzer. • To plan, set up and carry out a fair test to see how changing the wire in a	• To understand that a current will only pass around the circuit if it is complete. Any break in the circuit will reduce the current to zero throughout the whole circuit. • To understand that resistors restrict or limit the flow of current in a circuit.	**Strand 1** electricity wires bulb flow battery **Strand 2** blow cell complete fuse filaments electrons

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	Assessment: Bulb brightness WS: Plan a scientific enquiry		circuit affects the brightness of a bulb. • To design and create a circuit for a particular purpose.		**Polysemous** blow cell fuse **Strand 3** Associate Compare Give reasons Use symbols Represent Plan Take measurements Record Use results Report Present Identify
	Summer 2: Evolution Working scientifically: Identify scientific evidence that has been used to support or refute ideas or arguments. Type of enquiry – Research Assessment: Bird beaks WS: Make predictions	• To know that living things produce offspring of the same kind, but that normally offspring vary and are not identical to their parents. • To know some common inherited characteristics, e.g. hair colour, eye colour, height, etc. • To know that in the case of identical twins, a fertilised egg splits in two. The genes in each half will be exactly the same, and so twins formed in this way will	• To identify features inherited from my parents and note variations. • To research to find animals that live in a particular environment around the world, recording the features that make it advantageous for its habitat. • To compare and contrast the features of two animals living in the same environment, explaining why each of their features are advantageous for that particular species.	• To understand the ways in which animals have adapted to suit its environment. • To understand that, over many generations, advantageous features may be spread across a whole species, making them better adapted to their environment. • To understand how the adaptation of plants and animals to suit their environment may lead to evolution	**Strand 1** family parents ancestors fossil variety **Strand 2** adaptation evolution inherited inheritance natural selection Prehistoric dinosaur trait variety

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	and identify scientific evidence	look identical in many ways. • To know that 'variation' occurs from generation to generation in a species. • To know some characteristics, such as brown eyes, are dominant. • To know that some inherited features are advantageous, and some are not. • To know that Darwin explained each step in the Linnaeus classification system to show where part of a population developed a new variation and eventually formed a new species. • To know that changes to an environment can affect the evolutionary process. • To know that palaeontologists study fossils to explore how species have evolved over time.	• To identify examples of variation in animals that are cross bred. • To carry out an investigation into Darwin's finches using tools such as tweezers to pick up seeds to identify how birds have evolved over time and how some species became extinct	• To understand Darwin's theory of evolution and the process of natural selection • To understand that some variations are caused by mutations, and that some of these are harmless, some are advantageous, and some are disadvantageous • To understand how humans have evolved over time, and how human behaviour can affect changes in other species over time. • To understand that scientists are always refining, changing and developing the ideas of other scientists, and that ideas can be refuted when further evidence is uncovered.	**Strand 3** Recognise Identify