

SCIENCE LONG TERM PLAN

There is a two-year rolling programme in place to fit with the mixed aged classes.

Biology

Chemistry

Physics

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	28 hours teaching time		26 hours teaching time		24 hours teaching time		28 hours teaching time		24 hours teaching time		26 hours teaching time	
	Year A						Year B					
EYFS	Marvellous Me! our bodies		Ticket to Ride! transport weather recording sinking & floating freezing & melting		Come Outside Seasons & weather plant growth lifecycles		One year programme					
Years 1 and 2	What is it made of? Everyday materials (Year 1) Uses (Year 2)	Who looks after you? Animals, including humans (Years 1 and 2)	How can we get there? Everyday materials (Year 1) Uses (Year 2)	Knight s and castles Seasonal changes (Year 1) Plants (Yrs 1 and 2)	What's cooking? Animals, including humans (Yrs 1 and 2) Plants (Yrs 1 and 2)	Where does it live? Living things and their habitats (Year 2)	Are you superhuman?	What do you know about chocolate?	Where do you live? Seasonal changes (Year 1)	Can you remember? Seasonal changes (Year 1) Everyday materials (Year 1) Uses (Year 2)	What can we grow? Plants (Years 1 and 2)	Where in the world? Living things and their habitats (Year 2) Animals (Yrs 1 and 2)
Years 3 and 4	May the force be with you. Forces and magnets (Year 3) Electricity (Year 4)		Road trip around North America Endangere d animals of North America.	Healthy me! Animals including humans(Year 3)	Light and dark Light (Year 3)	Rocky Road Rocks (Year 3)	Super humans Animals including humans (Year 4)	Sound Sound (Year 4)	Extreme Earth States of matter (Year 4)		Let's grow Plants (Year 3)	Amazing world Living things and their habitats (Year 4)

Years 5 and 6	To infinity and beyond Earth and space (Year 5)	Eureka! Forces and magnets (Year 5)	Amazing Mayans Light (Y6)	What's cooking? Properties and changes of materials (year 5)	That's entertainme nt Electricity (Year 6)	It's all ancient history Evolution and inheritance (Year 6)	Superheroes Animals including humans (Yrs 5 and 6)	Let's grow. Living things and their habitats (Years 5 and 6) classification-plants, animals and mic orgs Life cycles	Amazing world: animal kingdom Living things and their habitats (Yrs 5 and 6) + adaptations (link to biomes)
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Working scientifically is threaded throughout our curriculum and is developed in all the science aspects covered.

EYFS Themes

Marvellous Me	
Links to the programme of study (Early Learning Goals (ELGs))	<p>The Natural World</p> <ul style="list-style-type: none"> • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter
Working Scientifically	Identifying and classifying different parts of the body, including bones which make up the skeleton, being able to identify different emotions and feelings, observing and talking about how our bodies change as we grow and finding out about this through the use of books and from the internet.
Vocabulary	<p>Emotions - Astonished, worried, excited, surprised, embarrassed, confused, nervous.</p> <p>Body Parts - Hips, shoulder, freckles, skin, bones, heart, lips</p> <p>Family - Relative, son, daughter niece, nephew, grandchild, celebration, caring, alike</p>
High Quality Texts	Funny Bones, The Colour Monster, Hello Friend

Ticket to Ride	
Links to the programme of study (Early Learning	<p>The Natural World</p> <ul style="list-style-type: none"> • Explore the natural world around them, making observations and drawing pictures of animals and plants.

Goals (ELGs)	<ul style="list-style-type: none"> • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter
Working Scientifically	Identifying similarities and differences between different modes of transport and how they are powered, different weather/seasons, observing and recording changes over time, using secondary sources to find out more information, carry out and record simple tests.
Vocabulary	<p>Land / water / air Aeroplane, train, bus, tractor, car, taxi, helicopter, boat, ferry, ship, yacht, hoverboat, jet ski, bicycle, rocket, tram, racing car. Speed, fast, slow, quicker, slower. Sounds for transport e.g. choo choo for a train, zoooooom for an aeroplane etc. Power for transport - Petrol, fuel, steam, electricity. Passenger, driver, pedestrian, pilot, captain, co-captain, customer, ticket, fare, timetable</p> <p><u>Verbs</u> - drive, row, steer, hover, rotate, melt, freeze</p>
High Quality Texts	The Train Ride, The Big Book of Trains, Look Inside Things That Go

Amazing Animals	
Links to the programme of study (Early Learning Goals (ELGs))	<p>The Natural World</p> <ul style="list-style-type: none"> • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter
Working Scientifically	
Vocabulary	<p>Spring Buds, chick, tadpoles, duckling, blossom, spring, hatch, grow, plant, capture, wriggle, young</p> <p>Mini-Beasts Dragonfly, wasp, centipede, beetle, flap, squirm, land (verb), search, identify, examine, tiny, delicate, lifecycle, cocoon Habitat, hibernate, nocturnal, climate</p>

High Quality Texts	Handa's Surprise,
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Come Outside	
Links to the programme of study (Early Learning Goals (ELGs))	<p>The Natural World</p> <ul style="list-style-type: none"> • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter
Working Scientifically	
Vocabulary	<p>Plants/Growth Bean, root, seed, soil, stem, watering can, vegetable, plant, grow, pick, collect, colourful</p> <p>Materials Bendy, dry, hard, old, rough, shiny, smooth, soft, wet, Recycle, reuse, reduce, paper, card, metal, glass, plastic</p>
High Quality Texts	The Tiny Seed, Oliver's Vegetables, Jack & the Beanstalk, Jasper's Beanstalk, A Stroll Through the Seasons, The Very Hungry Caterpillar, Argh a Spider

Commotion in the Ocean	
Links to the programme of study (Early Learning Goals (ELGs))	<p>The Natural World</p> <ul style="list-style-type: none"> • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter
Working Scientifically	

Vocabulary	Beach Kite, pier, pebbles, lifeguard, yacht, seagull, starfish, lighthouse, waves, save, search, paddle, bumpy, smooth, deep, shallow Anchor, jellyfish, squid, shark, whale, endangered, index, predict, dorsal, fin
High Quality Texts	Lighthouse Keeper's Lunch, Tiddler, Surprising Sharks (non-fiction), The Sand Horse, Rainbow Fish

Key Stage 1 units

We feel that as children are taught in a 2 year rolling programme, there is a need to ensure that children can access their Science Curriculum successfully irrespective of whether they join in Year A or B. We want to ensure that there is a clear progression of learning for each topic and opportunity to build and recap, across the two years. Therefore, Materials and Plants will be studied each year in KS1 with a clear progression having been thought through. Throughout KS1, children will be encouraged to be curious and to ask questions about what they notice. Seasonal changes will be observed each term, throughout KS1, so by the end of KS1 children will be familiar with how the seasons vary, although there will be a focus in the Spring term to ensure all key knowledge is covered.

Everyday Materials	
Chemistry	Key Stage 1 (Years 1 and 2)
Links to themes / topics in school	What is it made of? How do we get there? Knights and Castles
Significant People	Charles Macintosh, John Dunlop, John McAdam, Wright brothers
Year 1 National Curriculum	<ul style="list-style-type: none"> distinguish between an object and the material from which it is made identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock describe the simple physical properties of a variety of everyday materials compare and group together a variety of everyday materials on the basis of their simple physical properties
Year 2 National Curriculum	<ul style="list-style-type: none"> identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses

	<ul style="list-style-type: none"> ● find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
Working scientifically	<p>Performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ... for lining a dog basket? ... for curtains? ... for a bookshelf? ... for a gymnast's leotard?'</p> <p>Comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); observing closely, identifying and classifying the uses of different materials, and recording their observations.</p> <p>STEM – aeroplane building and testing STEM – building a bridge</p>
Vocabulary	flexible, gas, liquid, magnetic, materials, metal, opaque, plastic, rigid, shiny, stretch, transparent, waterproof, wood, squash, twist, bend, absorb, bumpy, dry, floating, frozen, ice, melting, reflection, sinking, smooth, symmetry, texture, wet
High quality texts	The Train Ride, Beegu, Rapunzel, Kasim and the Ferocious Dragon
'Sticky knowledge' and key learning ideas.	<ul style="list-style-type: none"> ● Know why some materials are more suitable than others for specific uses ● Know why glass, wood, plastic, brick or paper would be used for certain jobs ● Know that some materials can be squashed, twisted or bent according to need ● Know why certain materials are suitable for many different uses ● Know about the lives of important people who have developed useful new materials ● Wood is used to make buildings and furniture and for making fires and heating. ● Most of the paper or cardboard we use came from trees. ● Glass is a hard transparent material that can be made in many shapes. ● Glass is usually transparent, which means you can see through it, but can also come in different colours. ● Glass is often used to make windows and bottles. ● Many churches have special coloured glass often used to make religious pictures. ● Plastics are used to make many of the things we use in everyday life. They are used for toys, bicycle helmets, mobile phones, window frames and many other common items. ● Petrol is used to make plastic and it was invented just over a 100 years ago.
SEND / PP	Children to be included in all lessons with appropriate scaffolding as part of a positive and supportive environment . Hands on activities with scribed ideas when required. Opportunities to record results with pictures and photos as quality first teaching..

	Vocabulary word mats with pictures/ widgets. Opportunities for scientific talk, with flexible mixed ability group working. Adults deployed appropriately, mix of TA and teacher working with SEND at different times. Pre teaching as appropriate.
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Plants	
Biology	Key Stage 1 (Years 1 and 2)
Links to themes / topics in school	What's cooking? What can we grow?
Significant People	
Year 1 National Curriculum	<ul style="list-style-type: none"> ● identify and name a variety of common wild and garden plants, including deciduous and evergreen trees ● identify and describe the basic structure of a variety of common flowering plants, including trees
Year 2 National Curriculum	<ul style="list-style-type: none"> ● 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
Working scientifically	<ul style="list-style-type: none"> ● I ask questions about how and why things are similar or different. ● I decide what to observe to identify or sort things. ● I make comparisons between simple features of objects, materials or living things. ● I sort objects by observable and behavioural features. ● I record my observations, using words or pictures, in sorting circles or tables. ● I identify similarities and differences and talk about them using simple scientific language. ● I use my observations to suggest how and why things are similar or different. ● I try to use my records to help sort or identify other things.
Vocabulary	deciduous, evergreen, tree, leaf, flower (blossom), petals, fruit, bulb, seed, roots, stem, trunk, branches, growth, germinate, light, temperature, reproduce, lifecycle
High quality texts	The World in my kitchen, Tree Giant, Pata's Pumpkin, Jack and the Beanstalk, BFG

<p>'Sticky knowledge' and key learning ideas.</p>	<ul style="list-style-type: none"> ● Know the names of a variety of common wild and garden plants ● Know the names of a variety of common trees ● Know the difference between deciduous and evergreen trees ● Know which plants grow in the local environment ● Trees and shrubs take in water and carbon dioxide and give out oxygen. ● Trees can live for a very long time. Some trees can live for thousands of years. ● Around 2000 different types of plants are used by humans to make food. ● Some plants are carnivores. A well known example of a carnivorous plant is the Venus Flytrap. ● Bamboo can be a fast growing plant. Some types can grow almost a metre in just one day! ● As well as looking beautiful, trees help purify the air and provide food and shelter for all sorts of creatures. ● Water and nutrients travel up the tree trunk, through the branches and all the way out to the leaves. ● A single tree has many roots. The roots carry food and water from the ground through the trunk and branches to the leaves of the tree. ● The trunk is the main body of the tree. The trunk is covered with bark which protects it from damage. ● The leaves can be of many different shapes. They take in sunlight and use water and food from the roots to make the tree grow. ● As a tree grows, it usually produces growth rings as new wood is laid down around the old wood.
<p>SEND / PP</p>	<p>Children to be included in all lessons with appropriate scaffolding as part of a positive and supportive environment . Hands on activities with scribed ideas when required. Opportunities to record results with pictures and photos as quality first teaching.. Vocabulary word mats with pictures/ widgets. Opportunities for scientific talk, with flexible mixed ability group working. Adults deployed appropriately, mix of TA and teacher working with SEND at different times. Pre teaching as appropriate.</p>

<p>Animals including humans</p>	
<p>Biology</p>	<p>Key Stage 1 (Years 1 and 2)</p>
<p>Links to themes / topics in school</p>	<p>Who looks after you? What do you know about chocolate? What's cooking? Where in the world?</p>

Significant People	Florence Nightingale, Mary Seacole Children to be included in all lessons with appropriate scaffolding . Hands on activities with scribed ideas when required. Opportunities to record results with pictures and photos.
Year 1 National Curriculum	<ul style="list-style-type: none"> ● identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals ● identify and name a variety of common animals that are carnivores, herbivores and omnivores ● describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) ● identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense
Year 2 National Curriculum	<ul style="list-style-type: none"> ● notice that animals, including humans, have offspring which grow into adults ● find out about and describe the basic needs of animals, including humans, for survival (water, food and air) ● describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene
Working scientifically	
Vocabulary	amphibians, fish, reptiles, mammals, birds, herbivore, omnivore, carnivore, head, nose, ear, neck, shoulder, arm, elbow, wrist, hand, back, chest, hip, leg, knee, ankle, foot, wing, beak, tail, fin, sight, smell, touch, taste, hearing, survival, water, air, food reproduce, adult, baby, offspring, kitten, calf, puppy, food chain, prey, predator, camouflage, protection, exercise, hygiene, balanced diet
High quality texts	Rainbow Fish, Storm Whale, The World in my kitchen, Traction man, Supertato, Super Daisy , Charlie’s superhero underpants, Charlie and the Chocolate Factory, Anna Hibiscus
‘Sticky knowledge’ and key learning ideas.	<ul style="list-style-type: none"> ● Know that animals, including humans, have young animals that look like them. ● Know that the babies will grow into adults. ● Know what humans need to survive (including food and water). ● Know what animals need to survive. ● Know why it is important to exercise. ● Know why it is important to eat the right amounts of food. ● Know why it is important to keep clean and wash regularly. ● Keeping healthy means caring for your body so you have enough energy to learn, play and grow.

	<ul style="list-style-type: none"> ● All foods contain nutrients which your body needs to stay active throughout the day. Some foods have more nutrients than others. ● Everyone should have their '5 a day' – this means five portions of fruit and vegetables, to get the right amount of nutrients. ● It's important not to eat too much sugar and salt: sugary foods are bad for your teeth and can be fattening, and salty foods can lead to heart disease. ● Keep your mouth healthy by brushing and flossing to have clean teeth and gums. ● It's important to have 30-60 minutes of exercise every day. This can include running around and playing games with friends.
SEND / PP	Children to be included in all lessons with appropriate scaffolding as part of a positive and supportive environment . Hands on activities with scribed ideas when required. Opportunities to record results with pictures and photos as quality first teaching.. Vocabulary word mats with pictures/ widgets. Opportunities for scientific talk, with flexible mixed ability group working. Adults deployed appropriately, mix of TA and teacher working with SEND at different times. Pre teaching as appropriate.

Living things and habitats	
Biology	Key Stage 1 (Years 1 and 2)
Links to themes / topics in school	Where does it live? Where in the world?
Significant People	
Year 1 National Curriculum	<ul style="list-style-type: none"> ●
Year 2 National Curriculum	<ul style="list-style-type: none"> ● explore and compare the differences 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 microhabitats

	<ul style="list-style-type: none"> describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food
Working scientifically	
Vocabulary	living, dead, habitat, microhabitat, woodland, meadow, hedgerow, pond
High quality texts	Rainbow Fish, Storm Whale, Hummingbird
'Sticky knowledge' and key learning ideas.	<ul style="list-style-type: none"> know how a specific habitat provides for the basic needs of things living there identify and name plants and animals in a range of habitats match living things to their habitat know how animals find their food name some different sources of food for animals A habitat is a place that an animal lives. It provides the animal with food, water and shelter. There are many different sorts of habitats around the world from forests to grasslands and from mountain slopes to deserts. Animals like cockroaches are really important in a habitat -they eat the dead plants and recycle the nutrients back into the soil. People are causing harm to many habitats. Forests are being burnt down, lakes and rivers polluted and the polar ice caps are melting. Because resources like water and food may be limited, plant and animal species often compete with each other for food and water. Because the Earth is always changing, habitats are constantly changing.
SEND / PP	Children to be included in all lessons with appropriate scaffolding as part of a positive and supportive environment . Hands on activities with scribed ideas when required. Opportunities to record results with pictures and photos as quality first teaching.. Vocabulary word mats with pictures/ widgets. Opportunities for scientific talk, with flexible mixed ability group working. Adults deployed appropriately, mix of TA and teacher working with SEND at different times. Pre teaching as appropriate.

Seasonal Changes

Physics	Key Stage 1 (Years 1 and 2)
Links to themes / topics in school	Where do you live? Can you remember when?
Significant People	
Year 1 National Curriculum	<ul style="list-style-type: none"> ● observe changes across the 4 seasons ● observe and describe weather associated with the seasons and how day length varies
Year 2 National Curriculum	<ul style="list-style-type: none"> ●
Working scientifically	<ul style="list-style-type: none"> ● I ask questions about how and why things change. ● With help, I identify changes to observe and measure and suggest how to do it. ● I use non-standard units and simple equipment to observe or measure change. ● I record in words or pictures, or in simple prepared formats such as tables and charts. ● I identify simple changes and talk about them using simple scientific language. ● I sequence the changes. ● I use my observations to suggest how and why things change.
Vocabulary	season, spring, summer, autumn, winter, month, year, day, night, sun, moon, light, dark
High quality texts	On the way home, Town mouse County mouse, Lila and the secret of rain, Vlad and the Great Fire of London, Samuel Pepys' diary
'Sticky knowledge' and key learning ideas.	<ul style="list-style-type: none"> ● In the UK we have four seasons: spring, summer, autumn and winter. Summer is the hottest season and winter the coldest. ● Spring starts when the day and night are the same length (usually 21st March. However, many say that Spring starts on March 1st). ● In summer the longest day of the year is around June 21st and in winter the shortest day of the year is usually December 21st. ● When we have our summer it is winter in the southern hemisphere. When we have our winter Australia has its summer. ● Seasons change throughout the year because of the way the Earth travels around the Sun.

SEND / PP	Children to be included in all lessons with appropriate scaffolding as part of a positive and supportive environment . Hands on activities with scribed ideas when required. Opportunities to record results with pictures and photos as quality first teaching.. Vocabulary word mats with pictures/ widgets. Opportunities for scientific talk, with flexible mixed ability group working. Adults deployed appropriately, mix of TA and teacher working with SEND at different times. Pre teaching as appropriate.
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Lower Key Stage 2 Units

In lower key stage 2 pupils will broaden their scientific view of the world around them. A clear link between Year 3 and 4 objectives has been made and that has determined the order in which the units are being taught in LKS2, throughout the two year rolling programme. We decided that biology, physics and chemistry units would be taught each year, with cross curricular links providing context to scientific learning.

Rock	
Chemistry	Key Stage 2 (Years 3 and 4)
Links to themes / topics in school	Rocky Road
Significant People	Mary Anning, Robert H Bakker
Year 3 National Curriculum	<ul style="list-style-type: none"> ● compare and group together different kinds of rocks on the basis of their appearance and simple physical properties ● describe in simple terms how fossils are formed when things that have lived are trapped within rock ● recognise that soils are made from rocks and organic matter
Year 4 National Curriculum	***
Working scientifically	<ul style="list-style-type: none"> ● asking relevant questions and using different types of scientific enquiries to answer them ● setting up simple practical enquiries, comparative and fair tests ● making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

	<ul style="list-style-type: none"> ● gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ● recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ● reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ● using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ● identifying differences, similarities or changes related to simple scientific ideas and processes ● using straightforward scientific evidence to answer questions or to support their findings.
Vocabulary	rock, slate, soil, sandstone, granite, chalk, soil, clay, sand, limestone, quartz, marble, stone, pebble, texture, absorbent, characteristic, texture, surface
High quality texts	Pebble in my pocket, The street beneath my feet
'Sticky knowledge' and key learning ideas.	<p>I will know that:</p> <ul style="list-style-type: none"> ● Sediment deposited over time, often as layers at the bottom of lakes and oceans, forms sedimentary rocks. ● Extreme pressure and heat over time forms metamorphic rocks. Examples are marble and slate. ● When magma cools and solidifies it forms igneous rock . Examples are granite and pumice. ● Rocks formed in different ways have different properties. ● Fossils form over millions of years and is a process where the living organism turns into rock. ● Soil is made from 4 things: I Worn down rock II Organic matter III Water IV Air ● Caves are formed when water permeates through the bedrock and erodes some of the rock away. Over thousands of years these caves can become very large ● Soil is the uppermost layer of the Earth. It is a mixture of different things: • minerals (the minerals in soil come from finely broken-down rock); • air; • water; • organic matter (including living and dead plants and animals).
SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed.

States of matter

Chemistry	Key Stage 2 (Years 3 and 4)
Links to themes / topics in school	Extreme Earth, volcanoes
Significant People	
Year 3 National Curriculum	***
Year 4 National Curriculum	<ul style="list-style-type: none"> ● compare and group materials together, according to whether they are solids, liquids or gases ● 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) ● identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature
Working scientifically	<ul style="list-style-type: none"> ● asking relevant questions and using different types of scientific enquiries to answer them ● setting up simple practical enquiries, comparative and fair tests ● making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ● gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ● recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ● reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ● using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ● identifying differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings.
Vocabulary	states of matter, gas, liquid, solid, water vapour, melt, freeze, evaporate, condensate, solidify, precipitation,
High quality texts	Non fiction Volcano books, The firework makers daughter.

<p>'Sticky knowledge' and key learning ideas.</p>	<p>I will know that:</p> <ul style="list-style-type: none"> • There are 3 states of matter - gas, solid and liquid • Particles in a solid are close together and cannot move. They can only vibrate. Particles in a liquid are close together but can move around each other easily. Particles in a gas are spread out and can move around very quickly in all directions. • When water and other liquids reach a certain temperature, they change state into a solid or a gas. The temperatures that these changes happen at are called the boiling, melting or freezing point. • If a solid is heated to its melting point, it melts and changes to a liquid. This is because the particles start to move faster and faster until they are able to move over and around each other. • When freezing occurs, the particles in the liquid begin to slow down as they get colder and colder. They can then only move gently on the spot, giving them a solid structure • Evaporation occurs when water turns into water vapour. This happens very quickly when the water is hot, like in a kettle, but it can also happen slowly, like a puddle evaporating in the warm air. • Condensation cold surface. and evaporation occur within the water cycle. • 1. Water from lakes, puddles, rivers and seas is evaporated by the sun's heat, turning it into water vapour. 2. This water vapour rises, then cools down to form water droplets in clouds (condensation). 3. When the droplets get too heavy, they fall back to the earth as rain, sleet, hail or snow (precipitation).
<p>SEND / PP</p>	<p>Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed.</p>

<p>Living things and their habitats</p>	
<p>Biology</p>	<p>Key Stage 2 (Years 3 and 4)</p>
<p>Links to themes / topics in school</p>	<p>Road trip around North America, Amazing World</p>
<p>Significant People</p>	
<p>Year 3 National Curriculum</p>	<p>***</p>

Year 4 National Curriculum	<ul style="list-style-type: none"> ● 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 ● recognise that environments can change and that this can sometimes pose dangers to living things
Working scientifically	<ul style="list-style-type: none"> ● asking relevant questions and using different types of scientific enquiries to answer them ● setting up simple practical enquiries, comparative and fair tests ● making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ● gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ● recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ● reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ● using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ● identifying differences, similarities or changes related to simple scientific ideas and processes ● using straightforward scientific evidence to answer questions or to support their findings.
Vocabulary	organisms, life processes, respiration, sensitivity, reproduction, excretion, nutrition, habitat, environment, endangered species, extinct.
High quality texts	The Miraculous Journey of Edward Tulane, The Journey, Fly Eagle Fly
'Sticky knowledge' and key learning ideas.	<ul style="list-style-type: none"> ● To stay alive and healthy, all living things need certain conditions that let them carry out the seven life processes: Plants and animals rely on the environment to give them everything they need. Therefore, when habitats change, it can be very dangerous to the plants and animals that live there. ● Natural Human-Made Changes to an environment can be natural or caused by humans. ● Changes to an environment can have positive as well as negative effects. ● Here are some examples of things that can change an environment. • earthquakes • storms • floods • droughts • wildfires • the seasons • deforestation • pollution • urbanisation • ● The introduction of new animal or plant species to an environment • creating new nature reserves Movement Respiration Sensitivity Growth Reproduction Excretion Nutrition.
SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed.

Animals, including humans	
Biology	Key Stage 2 (Years 3 and 4)
Links to themes / topics in school	Healthy Me
Significant People	
Year 3 National Curriculum	<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
Year 4 National Curriculum	<ul style="list-style-type: none"> ● 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
Working scientifically	<ul style="list-style-type: none"> ● asking relevant questions and using different types of scientific enquiries to answer them ● setting up simple practical enquiries, comparative and fair tests ● making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ● gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ● recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ● reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ● using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ● identifying differences, similarities or changes related to simple scientific ideas and processes ● using straightforward scientific evidence to answer questions or to support their findings.
Vocabulary	digest, oesophagus, stomach, stomach acid, small intestine, large intestine, faeces, Digestive System Teeth, molar, canine, incisor, premolar, wisdom teeth, salivary gland, Human Body -liver, gallbladder, duodenum, rectum,

	oesophagus, stomach, pancreas, anus, large intestine, small intestine. Animals - herbivore, carnivore, omnivore, producer, organism, predator, prey.
High quality texts	Charlotte's Web, Non fiction my body books.
'Sticky knowledge' and key learning ideas.	<p>I will know:</p> <ul style="list-style-type: none"> ● That humans cannot make their own food. They get their nutrition from what they eat. ● That humans have skeletons and muscles for support, protection and movement. ● Know that the body parts have special functions. ● Know the names of the body parts associated with skeleton and muscles. ● Compare the diets of different groups of animals, including humans. ● Know what a healthy meal looks like. ● Know and name the parts of the digestive system. ● Know the function of each organ of the digestive system. ● Know and identify the different types of teeth in humans. ● Know the function of different human teeth. ● Use food chains to identify producers, predators and prey. ● Construct food chains to identify producers, predators and prey.
SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed.

Plants	
Biology	Key Stage 2 (Years 3 and 4)
Links to themes / topics in school	Let's Grow.
Significant People	

Year 3 National Curriculum	<ul style="list-style-type: none"> ● identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers ● 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 ● 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
Year 4 National Curriculum	***
Working scientifically	<ul style="list-style-type: none"> ● asking relevant questions and using different types of scientific enquiries to answer them ● setting up simple practical enquiries, comparative and fair tests ● making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ● gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ● recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ● reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ● using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ● identifying differences, similarities or changes related to simple scientific ideas and processes ● using straightforward scientific evidence to answer questions or to support their findings.
Vocabulary	roots, stem, leaves, nutrients, flowers, evaporation, fertilisation, petal, stamen, carpel, septal, pollination, pollinator, germination, seed dispersal.
High quality texts	Lob, non fiction plant life books.
'Sticky knowledge' and key learning ideas.	<ul style="list-style-type: none"> ● Know the function of the different parts of the flowering plant. ● Identify and know the names of: stem; roots; leaves and flowers. ● Know what a plant needs to grow. ● Know that light, air, water, nutrients from soil are all important for plant growth. ● Find out how water is transported within a plant. ● Know the part that flowers play in the life cycle of a flowering plant. ● Know about pollination, seed formation and seed dispersal.

SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed.
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Light	
Physics	Key Stage 2 (Years 3 and 4)
Links to themes / topics in school	Within Anglo Saxon topic
Significant People	
Year 3 National Curriculum	<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 light from the sun can be dangerous and that there are ways to protect their eyes ● 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
Year 4 National Curriculum	***
Working scientifically	<ul style="list-style-type: none"> ● asking relevant questions and using different types of scientific enquiries to answer them ● setting up simple practical enquiries, comparative and fair tests ● making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ● gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ● recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ● reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ● using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ● identifying differences, similarities or changes related to simple scientific ideas and processes ● using straightforward scientific evidence to answer questions or to support their findings.

Vocabulary	light, light source, dark, reflection, reflect, reflective, ray, pupil, retina, shadow, opaque, translucent, transparent.
High quality texts	Leon and the place inbetween, The King who was afraid of the dark
'Sticky knowledge' and key learning ideas.	<p>I will know</p> <ul style="list-style-type: none"> ● light and dark is the absence of light. ● classify objects as transparent, translucent or opaque dependant on the amount of light travelling through. ● find patterns in the way that the size of shadows change. ● that materials as reflective or non-reflective Knowledge. ● that light can come from a variety of sources both man made and natural. ● that to see an object light is reflected from its surface and into the eye. ● that light from the Sun can be dangerous and eyes need to be protected. ● that shadows are formed when an object blocks the path of light.
SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed.

Sound	
Physics	Key Stage 2 (Years 3 and 4)
Links to themes / topics in school	Romans (stand alone science sessions)
Significant People	
Year 3 National Curriculum	***

Year 4 National Curriculum	<ul style="list-style-type: none"> ● identify how sounds are made, associating some of them with something vibrating ● recognise that vibrations from sounds travel through a medium to the ear ● find patterns between the pitch of a sound and features of the object that produced it ● find patterns between the volume of a sound and the strength of the vibrations that produced it ● recognise that sounds get fainter as the distance from the sound source increases
Working scientifically	<ul style="list-style-type: none"> ● asking relevant questions and using different types of scientific enquiries to answer them ● setting up simple practical enquiries, comparative and fair tests ● making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ● gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ● recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ● reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ● using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ● identifying differences, similarities or changes related to simple scientific ideas and processes ● using straightforward scientific evidence to answer questions or to support their findings.
Vocabulary	vibration, sound wave, volume, amplitude, pitch, ears, particles, distance, sound proof, absorb sound, eardrum, vacuum,
High quality texts	Non fiction sound books, Ilianas Diary
'Sticky knowledge' and key learning ideas.	I will know: <ul style="list-style-type: none"> ● how sound is made. ● how sound travels from the source to the ears. ● to associate sound with vibration. ● the correlation between pitch and the object producing a sound. ● the correlation between the volume of a sound and the strength of the vibrations that produced it. ● what happens to a sound as it travels away from its source.
SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed.

Forces and magnets	
Physics	Key Stage 2 (Years 3 and 4)
Links to themes / topics in school	May the force be with you?
Significant People	
Year 3 National Curriculum	<ul style="list-style-type: none"> ● compare how things move on different surfaces ● 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 ● describe magnets as having 2 poles ● predict whether 2 magnets will attract or repel each other, depending on which poles are facing
Year 4 National Curriculum	***
Working scientifically	<ul style="list-style-type: none"> ● asking relevant questions and using different types of scientific enquiries to answer them ● setting up simple practical enquiries, comparative and fair tests ● making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ● gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ● recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ● reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ● using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ● identifying differences, similarities or changes related to simple scientific ideas and processes ● using straightforward scientific evidence to answer questions or to support their findings.
Vocabulary	forces, friction, pull, push, magnet, magnetic, repel, attract, magnetic field, poles

High quality texts	The Iron Man
'Sticky knowledge' and key learning ideas.	<p>I will:</p> <ul style="list-style-type: none"> ● know that an object needs a force to move ● Know that a force can be either a push or pull ● What friction is? ● What causes friction. ● Different surfaces cause different amounts of friction ● know that the needle on a compass is a magnet ● Know that magnets have two poles. ● Know which material attract magnets
SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed.

Electricity	
Physics	Key Stage 2 (Years 3 and 4)
Links to themes / topics in school	May the force be with you and Egyptians (finished off electricity)
Significant People	
Year 3 National Curriculum	***

Year 4 National Curriculum	<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 conductor
Working scientifically	<ul style="list-style-type: none"> ● asking relevant questions and using different types of scientific enquiries to answer them ● setting up simple practical enquiries, comparative and fair tests ● making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ● gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ● recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ● reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ● using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ● identifying differences, similarities or changes related to simple scientific ideas and processes ● using straightforward scientific evidence to answer questions or to support their findings.
Vocabulary	Series circuit, circuit diagram, parallel circuit, conductor, insulator, loop, switch, resistance, battery, bulb, wire, transformer, appliances, danger, material, metal, plastic.
High quality texts	The Iron Man

'Sticky knowledge' and key learning ideas.	<ul style="list-style-type: none"> ● Know about common appliances that run on electricity. ● Know how to construct a simple series electrical circuit. ● Identify and name the basic parts of the circuit, including cells, wires, bulbs, switches and buzzers. ● Know that a switch opens and closes a circuit. ● Know about some common conductors and insulators. ● Know that metals are good conductors.
SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed.

Upper Key Stage 2 Units

In upper key stage 2, pupils will develop a deeper understanding of a wide range of scientific ideas. They will explore and talk about their ideas; ask their own questions about scientific phenomena; and analyse functions, relationships and interactions more systematically. They will encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They will begin to recognise that scientific ideas change and develop over time. They will select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils will conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings. We decided to have a greater emphasis on biology units in one year of the two year rolling programme to support depth of learning, the sequence of chemistry and physics units in the alternative year helps to build upon key skills and knowledge.

Properties and changes of materials	
Chemistry	Key Stage 2 (Years 5 and 6)
Links to themes / topics in school	What's Cooking (recipes and the chemical reactions involved in making bread)
Significant People	

Year 5 National Curriculum	<ul style="list-style-type: none"> ● Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets. ● Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. ● Use the knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. ● Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. ● Demonstrate that dissolving, mixing and changes of state are reversible changes. ● Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.
Year 6 National Curriculum	N/A
Working scientifically	<ul style="list-style-type: none"> ● Planning different types of enquiries to answer questions, including recognising variables where necessary. ● Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeated readings where necessary. ● Reporting and presenting findings from enquiries including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. ● Read, spell and pronounce scientific vocabulary correctly.
Vocabulary	materials, solids, ;liquids, gases, melting, freezing, evaporating, condensing, conductor, insulator, transparency, dissolving, solution, soluble, suspension.
High quality texts	
'Sticky knowledge' and key learning ideas.	KLI <ul style="list-style-type: none"> ● Properties of materials: Compare and group together everyday materials on the basis of their properties, including their hardness, transparency and response to magnets by sorting and classifying materials according to their properties. ● Conductors and insulators: Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic by investigating thermal conductors and insulators. To compare and group together everyday materials on the basis of their thermal conductivity by investigating thermal conductors and insulators. ● Dissolving: To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic by investigating the best electrical conductors. To compare and group together everyday materials on the basis of their electrical conductivity by investigating the best electrical conductors.

	<ul style="list-style-type: none"> ● Separating mixtures: To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating by separating different mixtures. To demonstrate that dissolving, mixing and changes of state are reversible changes by separating different mixtures. To describe how to recover a substance from a solution by separating different mixtures. ● Irreversible 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 by identifying and observing irreversible chemical changes. <p>Sticky Knowledge:</p> <ul style="list-style-type: none"> ● Different materials are used for particular jobs based on their properties: electrical conductivity, flexibility, hardness, insulators, magnetism, solubility, thermal conductivity, transparency. For example, glass is used for windows because it is hard and transparent. Oven gloves are made from a thermal insulator to keep the heat from burning your hand. ● Dissolving: A solution is made when solid particles are mixed with liquid particles. Materials that will dissolve are known as soluble. Materials that won't dissolve are known as insoluble. A suspension is when the particles don't dissolve. ● Irreversible changes often result in a new product being made from the old materials (reactants). For example, burning wood produces ash. Mixing vinegar and milk produces casein plastic. ● Reversible changes, such as mixing and dissolving solids and liquids together, can be reversed by sieving, filtering and evaporating: Smaller materials are able to fall through the holes in the sieve, separating them from larger particles. The solid particles will get caught in the filter paper but the liquid will be able to get through. The liquid changes into a gas, leaving the solid particles behind.
SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed. Step by step instructions. Personalised checklists

Animals, including humans	
Biology	Key Stage 2 (Years 5 and 6)
Links to themes / topics in school	Keeping healthy

Significant People	**
Year 5 National Curriculum	N/A
Year 6 National Curriculum	<ul style="list-style-type: none"> ● Describe ways in which nutrients and water are transported within animals, including humans. ● Identify and name the parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. ● Recognise the impact of diet, exercise, drugs and lifestyle and the way their bodies function.
Working scientifically	<ul style="list-style-type: none"> ● Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. ● Identifying scientific evidence that has been used to support or refute ideas or arguments. ● Taking measurements with a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where necessary. ● Using test results to make predictions to set up further comparative and fair tests. ● recording data and results of increasing complexity using scientific diagrams and labels, tables and bar charts.
Vocabulary	heart, lungs, blood, plasma, blood vessels, veins, arteries, capillaries, circulatory system, oxygenated, deoxygenated, drug, alcohol, nutrients
High quality texts	Kay's Anatomy
'Sticky knowledge' and key learning ideas.	<p>KLI</p> <ul style="list-style-type: none"> ● Parts of the circulatory system ● Functions of the circulatory system ● Transporting water and nutrients through the body and how this process occurs. ● Healthy lifestyle and the link between this and diet and exercise. ● Exercise investigation ● Impact of drugs and alcohol <p>SK</p> <ul style="list-style-type: none"> ● Mammals have hearts with four chambers. Notice how the blood that has come from the body is deoxygenated, and the blood that has come from the lungs is oxygenated again. The blood isn't actually red and blue: we just show it like that on a diagram. ● The heart pumps blood to the lungs to get oxygen. It then pumps this oxygenated blood around the body.

	<ul style="list-style-type: none"> ● Capillaries are the smallest blood vessels in the body and it is here that the exchange of water, nutrients, oxygen and carbon dioxide takes place. ● Arteries carry oxygenated blood away from the heart. If you linked up all of the body's blood vessels, including arteries, capillaries, and veins, they would measure over 60,000 miles. ● Veins carry deoxygenated blood toward the heart. ● Blood transports: ● gases (mostly oxygen and carbon dioxide); ● nutrients (including water); ● waste products. ● Regular exercise: strengthens muscles including the heart muscle; ● improves circulation; ● increases the amount of oxygen around the body; ● releases brain chemicals which help you feel calm and relaxed; ● helps you sleep more easily; ● strengthens bones. ● Drugs, alcohol and smoking have negative effects on the body. A healthy diet involves eating the right types of nutrients in the right amounts.
SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed. Step by step instructions. Personalised checklists

Living things and their habitats (2 parts)	
Biology	Key Stage 2 (Years 5 and 6)
Links to themes / topics in school	Amazing world: animal kingdom (Y6 objectives) Lets Grow (Y5 objectives)
Significant People	
Year 5 National Curriculum	<ul style="list-style-type: none"> ● Describe the differences in life cycles of a mammal, amphibian, insect and bird. ● Describe the life process of reproduction in som plants and animals
Year 6 National Curriculum	<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 microorganisms, plants and animals. ● Give reasons for classifying plants and animals based on their characteristics.

Working scientifically	<ul style="list-style-type: none"> ● Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. ● Recording data and results of increasing complexity using scientific diagrams, labels, classification keys, tables and bar and line graphs.
Vocabulary	Amazing world: characteristics, key, taxonomist, bacteria, microorganism, microscope, species, microbe, bacteria, virus
High quality texts	
'Sticky knowledge' and key learning ideas.	<p>KLI: animal kingdom</p> <ul style="list-style-type: none"> ● The animal kingdom: classifying creatures ● classification keys: how do we use them? plants and animals ● Micro organisms ● Field study of local organisms. <p>SN:</p> <ul style="list-style-type: none"> ● Living things can be classified by eight levels. The number of living things in each level gets smaller until the one animal is left in its species level. ● Microorganisms are viruses, bacteria, moulds and yeast. Some animals (dust mites) and plants (phytoplankton) are also microorganisms. ● Microorganisms are very tiny living things that can only be seen using a microscope. They can be found in and on our bodies, in the air, in water and on objects around us. ● Scientists, called Taxonomists, sort and group living things according to their similarities and differences. <p>KLI: life cycles:</p> <ul style="list-style-type: none"> ● the life cycle of reptiles, amphibians, insects and humans and the differences. ● Know the names of the part of the plant related to its reproduction. ● Describe the stages of reproduction of a plant ● Create a biome in a bag. <p>SN:</p>

SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed. Step by step instructions. Personalised checklists
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Evolution and inheritance	
Biology	Key Stage 2 (Years 5 and 6)
Links to themes / topics in school	'It's all Ancient history: the stone, bronze and iron ages
Significant People	Charles Darwin
Year 5 National Curriculum	
Year 6 National Curriculum	<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 plant and animals are adapted to their environment in different ways and that adaptation may lead to evolution.
Working scientifically	<ul style="list-style-type: none"> ● Use relevant information and data from a range of secondary sources. ● Identify scientific evidence that has been used to support or refute arguments. ● read, spell and pronounce scientific vocabulary correctly
Vocabulary	offspring, adaptation, evolution, inheritance, paleontologist, chromosomes, genes, variation, characteristics, habitat, environment, fossil, natural selection, adaptive trait, inherited trait.
High quality texts	

<p>'Sticky knowledge' and key learning ideas.</p>	<p>Key learning ideas:</p> <ul style="list-style-type: none"> ● Inheritance ● Evolution ● Theory of evolution ● Charles Darwin as a great British citizen ● Evidence for evolution: plants and animals ● Evidence for evolution: Humans ● adaptation, evolution and human intervention
	<p>Sticky knowledge:</p> <ul style="list-style-type: none"> ● Evolution is a scientific theory used by biologists. It explains how living things changed over a long time, and how they have come to be the way they are. ● We know that living things have changed over time, because we can see their remains in the rocks. ● We know that the animals and plants of today are different from those of long ago. ● Evolutionary questions are still being actively researched by biologists. ● Eye, hair colour, ear lobes are examples of inherited traits. ● Adaptive traits are characteristics influenced by the environment then living things live in. These adaptations can result because of many things such as climate, food, environment etc. ● There are many types of environments around the world which plants and animals have adapted to in a variety of ways. Name and explore specific examples of animals and environments. ● Fossils are the part or full remains of creatures/plants that lived millions of years ago. They help us understand how plants and animals have evolved over time.
<p>SEND / PP</p>	<p>Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed. Step by step instructions. Personalised checklists</p>

<h2 style="background-color: #76b82a; color: white; padding: 5px;">Light</h2>	
<p>Physics</p>	<p>Key Stage 2 (Years 5 and 6)</p>
<p>Links to themes / topics in school</p>	<p>Spring term 1. Stand alone topic but will use knowledge gained from this subject when studying 'That's Entertainment' and learning about electricity</p>

Significant People	Isaac Newton, Ibn al-Haytham, Humphry Davy
Year 5 National Curriculum	<ul style="list-style-type: none"> •
Year 6 National Curriculum	<ul style="list-style-type: none"> • Recognise that light appears to travel in straight lines • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
Working scientifically	<ul style="list-style-type: none"> • Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeated readings where necessary. • Reporting and presenting findings from enquiries including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. • Read, spell and pronounce scientific vocabulary correctly.
Vocabulary	light, source, reflection, visible spectrum, prism, shadow, transparent, translucent, opaque, vacuum, angle, incidence, ray
High quality texts	
'Sticky knowledge' and key learning ideas.	<p>Key Learning ideas</p> <ul style="list-style-type: none"> • How do we see? • Reflecting light • Refraction • Spectrum • Colours • Shadows <p>Sticky knowledge</p> <ul style="list-style-type: none"> • Light from the sun travels in a straight line and hits the chair. The light ray is then reflected off the chair and travels in a straight line to the girl's eye, enabling her to see the chair. • We need light to be able to see things. Light waves travel in straight lines from light sources called rays or beams of light.

	<ul style="list-style-type: none"> ● Light travels as a wave. But unlike waves of water or sound waves, it does not need a medium to travel through. This means light can travel through a vacuum - a completely airless space. ● The law of reflection states that the angle of incidence is equal to the angle of reflection. Whenever light is reflected from a surface, it obeys this law. ● Isaac Newton shone a light through a transparent prism, separating out light into the colours of the rainbow (red, orange, yellow, green, blue, indigo and violet) - the colours of the spectrum. All the colours together merge and make visible light. ● The spoon in this water looks as if it is bent. This is because light bends when it moves from air to water. When light bends in this way, it is called refraction. ● A shadow is always the same shape as the object that casts it. This is because when an opaque object is in the path of light travelling from a light source, it will block the light rays that hit it, while the rest of the light can continue travelling. ● Shadows can also be elongated or shortened depending on the angle of the light source. A shadow is also larger when the object is closer to the light source. This is because it blocks more of the light.
SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed. Step by step instructions. Personalised checklists

Forces	
Physics	Key Stage 2 (Years 5 and 6)
Links to themes / topics in school	Autumn term 2. Stand alone topic.
Significant People	Sir Isaac Newton
Year 5 National Curriculum	<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 impact

Year 6 National Curriculum	<ul style="list-style-type: none"> •
Working scientifically	<ul style="list-style-type: none"> • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat reading when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
Vocabulary	gravitational pull, air resistance, opposing force, streamline, aerodynamic, water resistance, hydrodynamic, molecules, compressed, friction, pulleys, levers, gears, cog, buoyancy, mechanism, surface area
High quality texts	
'Sticky knowledge' and key learning ideas.	<p>Key Learning Ideas</p> <ul style="list-style-type: none"> • Gravity - what causes different objects to fall at different speeds? • Water resistance - what causes different objects to sink at different speeds? • Friction - experimenting the strength of frictional force created by different types of materials • Mechanisms - how levers, pulleys and gears work <p>Sticky knowledge</p> <ul style="list-style-type: none"> • The gravitational pull on Earth is the same for every object. Air resistance causes objects to fall to the Earth at different speeds. • Buoyancy is the opposing force to gravity when an object is in water. • The more streamline an object, less air resistance can catch the object to slow it down. Likewise in water, the more streamline the object, less water resistance can catch the object to reduce its speed. • The rougher the surface on a particular material, the greater the frictional force causing an object to reduce speed and stop much faster. • Levers, pulleys and gears require a smaller force to have a greater impact.
SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed. Step by step instructions. Personalised checklists.

Earth and space	
Physics	Key Stage 2 (Years 5 and 6)
Links to themes / topics in school	To Infinity and Beyond! Space topic: Art:night sky. DT: design and make a Mars rover moving vehicle
Significant People	Tim Peake, Helen Sharman, Neil Armstrong, Katherine Johnson, Dorothy Vaughan. Mary Jackson (Hidden Figures)
Year 5 National Curriculum	<ul style="list-style-type: none"> Describe the movement of the earth, and other planets, relative to the sun in the solar system. Describe the movement of the moon relative to the earth. Describe the Sun, Earth and Moon as approximately spherical bodies. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
Year 6 National Curriculum	
Working scientifically	<ul style="list-style-type: none"> Identifying scientific evidence that has been used to support or refute ideas or arguments. Read, spell and pronounce scientific vocabulary correctly.
Vocabulary	Earth, Sun, Moon, planet, star, satellite, orbit, axis, rotation, time zones, season, phases, lunar, planet names (MVEMJSUN) sphere, spherical bodies, astronaut, celestial bodies.
High quality texts	Cosmic (Class read and key text to be used in English lessons) Tim Peake- Ask an astronaut (topic books from library)
'Sticky knowledge' and key learning ideas.	<p>Key learning ideas:</p> <ul style="list-style-type: none"> Spherical bodies: How the Earth, Sun and Moon interact. Planets in our Solar system Night and Day-rotation of the Earth Seasons-How and Why** Phases of the moon and the impact this has on Earth History of space travel The future of space travel <p>Sticky knowledge:</p>

	<ul style="list-style-type: none"> • Earth rotates on its axis. It does one full rotation every 24 hours. At the same time, it is also orbiting around the sun. This takes 365 (and a quarter) days. Daytime occurs when the side of Earth is facing towards the sun. Night occurs when the side of Earth is facing away the sun. • It appears to us that the sun moves across the sky during the day but the sun does not move at all. The sun appears to move because of the movement of Earth. • Years ago, people believed that planets and the sun moved around the Earth (Geocentric model), whereas now we know it is the heliocentric model (all planets orbit the sun). • The moon orbits Earth in an oval shaped path while spinning on its axis. At various times in a month, the moon appears to be different shapes. This is because as the moon rotates around Earth, the sun lights up different parts of it. • Mercury, Venus, Earth and Mars are rocky planets, mostly made up of metal and rock. Jupiter, Saturn, Uranus and Neptune are mostly made up of gases (helium and hydrogen) although they do have cores made up of rock and metal.
SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed. Step by step instructions. Personalised checklists

Electricity	
Physics	Key Stage 2 (Years 5 and 6)
Links to themes / topics in school	That's entertainment! DT: design and make beat the buzzer game
Significant People	William Gilbert, Alessandro Volta, Michael Faraday, Thomas Edison, Lewis Latimer
Year 5 National Curriculum	N/A
Year 6 National Curriculum	<ul style="list-style-type: none"> • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in a circuit. • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. • Use recognised symbols when representing a simple circuit in a diagram.

Working scientifically	<ul style="list-style-type: none"> ● Planning different types of enquiries to answer questions, including recognising variables where necessary. ● Taking measurements using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where necessary. ● Reporting and presenting findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results in oral and written forms. ● Pupils should read, spell and pronounce scientific vocabulary correctly.
Vocabulary	circuit, symbol, cell, battery, current, amps, voltage, resistance, electrons, symbols of a circuit diagram
High quality texts	The Nowhere Emporium
'Sticky knowledge' and key learning ideas.	<p>Key ideas:</p> <ul style="list-style-type: none"> ● Explain the importance of the major discoveries in electricity. ● Use recognised symbols when representing a simple circuit in a diagram by observing and explaining the effect of different volts in a circuit. ● Associate the brightness of a bulb or the volume of a buzzer with the number and voltage of cells used in the circuit by observing and explaining the effect of different volts in a 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 Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary by investigating the relationship between wire length and the brightness of bulbs or the loudness of buzzers. <p>Sticky knowledge:</p> <ul style="list-style-type: none"> ● What will make a bulb brighter or a buzzer louder? • More batteries or a higher voltage create more power to flow through the circuit. • Shortening the wires means the electrons have less resistance to flow through. ● Series Circuit A circuit that has only one route for the current to take. If more bulbs or buzzers are added, the power has to be shared and so they will be dimmer or quieter. If just one part of this series circuit breaks, the circuit is broken and the flow of current stops. ● What will make a bulb dimmer or a buzzer quieter? • Fewer batteries or a lower voltage give less power to the circuit. • More buzzers or bulbs mean the power is shared by more components. • Lengthening the wires means the electrons have to travel through more resistance.
SEND / PP	Talk partners, time to share, supported resources where appropriate. Modified tasks, Tablets for spelling and sentence structure where needed. Step by step instructions. Personalised checklists