

MPPS - Science Curriculum Whole School Overview

This document shares Science curriculum narrative from EYFS to Year 6, as well as a more in-depth look at how each unit builds up on prior learning and concepts. CUSP materials are used in Key Stage 1 and 2. Whilst the EYFS Framework is structured differently to the national curriculum, we aim to show how The Natural World aspect of the Early Years Framework feeds into the Science national curriculum programmes of study, and how children in Reception are prepared for Year 1.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	<p>Explore the natural world around them, making observations and drawing pictures of animals and plants Exploring the school environment and grounds.</p> <p>Seasons Understanding changes in weather and the seasons—Autumn hunt, exploring the woodland</p>	<p>Seasons Understand some important processes and changes in the natural world around them, including the and changing states of matter. Changes in weather and the seasons—Winter Noticing frost and ice, exploring how to melt ice</p>	<p>Explore the natural world around them, making observations and drawing pictures of animals Night and Day time</p> <p>Nocturnal animals</p>	<p>Seasons Understanding changes in weather and the seasons—Spring Planting and growing</p> <p>Explore the natural world around them, making observations and drawing pictures of animals and plants Eggs and chicks (visiting nursery)</p>	<p>Explore the natural world around them, making observations and drawing pictures of animals and plants Caring for animals and the environment. —Drawing pictures of flowers and animals. understanding different minibeasts and their habitats Planting</p>	<p>Seasons Understanding changes in weather and the seasons—Summer</p> <p>Planting—Growth and decay</p> <p>Explore the natural world around them, making observations and drawing pictures of animals and plants Sea creatures</p>
Year 1	<p>Everyday Materials 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</p>	<p>Seasonal change Animals, Including Humans (identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</p>	<p>Animals, Including Humans (identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p>	<p>Seasonal Change Plants (identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p>	<p>Plants (identify and name a variety of common wild and garden plants, including deciduous and evergreen trees)</p>	<p>Animals, Including Humans (identify and name a variety of common animals that are carnivores, herbivores and omnivores Seasonal Change</p>
Year 2	<p>Revisit Yr1 Materials Materials identify and compare the suitability of a variety of</p>	<p>Animals including humans (notice that animals, including humans, have offspring which grow into adults</p>	<p>Revisit Materials Introduce Living things and their habitats.</p>	<p>Revisit (Yr1) Plants (identify and name a variety of common wild and garden plants, including deciduous and evergreen trees)</p>	<p>Plants observe and describe how seeds and bulbs grow into mature plants find out and describe how plants need water, light</p>	<p>Revisit Animals including humans Living things and their habitats</p>

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	<p>everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p>find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>(explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</p>	<p>Plants</p> <p>observe and describe how seeds and bulbs grow into mature plants</p> <p>find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p>and a suitable temperature to grow and stay healthy.</p>	<p>(identify and name a variety of plants and animals in their habitats, including micro- habitats</p> <p>describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p>
Year 3	Light	<p>Revisit Yr2 Plants</p> <p>Plants</p> <p>identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant</p> <p>Introduce Animal including human (identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	<p>Animals including Humans identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.</p>	Forces and magnets	<p>Plants</p> <p>investigate the way in which water is transported within plants</p> <p>explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	Rocks (end point- not covered again)
Year 4	Electricity	States of Matter	Living things and their habitats	Animals, including humans describe the simple functions of the basic parts	Living things and their habitats	Sound (end point- note covered again)



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				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.		
Year 5	Properties and changes of materials Everyday Materials	Earth and Space (end point – not covered again)	Revisit and introduce Animals Including humans	Introduce Living things and their habitats	Revisit magnets and introduce Forces (end point- not covered again)	Revisit Living Things and their Habitats
Year 6	Revisit Yr4 Electricity and Introduce Electricity	Introduce Living Things and their Habitats	Introduce Evolution and Inheritance	Animals including Humans	Animals including Humans – water transportation	Light

Year 7 (at Moorend Academy)

Cells & Photosynthesis	Particles & Simple chemical reactions	Energy & electricity	The solar system	Energy transfers	Ecology
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EYFS - (Understanding of the World - The Natural World)

Biology - Explore the natural world around them, making observations and drawing pictures of animals and plants.

Chemistry - 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.

Physics - Understand some important processes and changes in the natural world around them, including seasons and changing states of matter.

In EYFS, children are provided with activities that encourage them to explore, problem solve, observe, predict, think, make decisions and talk about the world around them.



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Nursery incubate eggs (chicks) observing the wonder of hatching. They experience taking care of newly hatched chicks observing their growth over a week or two. They experience gentle handling, understanding their own hygiene at this time as well as that of the birds. In Reception, they think carefully about how to look after animals to keep them healthy. They study their own body and start naming parts of the body and how to keep healthy.

Children make good use of the school grounds, exploring the school environment, seeing how it changes over the different seasons. They investigate snow and ice and seeing what happens when it melts.

They study plants and what makes plants grow and investigate growing plants from seeds or bulbs. Children plant their own seeds and keep a record of the growth as well as talk about how they are going to look after it, such as watering.

Children explore textures of familiar and more unusual foods. They observe the changes that occur when ingredients are mixed whisked, kneaded, heated and frozen. In baking or cooking, or preparing food, children explore textures and see how materials change when mixed together or when heat is applied.

KEY STAGE 1

Pupils study the **Seasons** and develop an early conceptual understanding of how **day becomes night**. An understanding of change, over time connects to the study of **Plants, including trees**. This focus enables children to associate trees as belonging to the plant kingdom and notice the changes deciduous trees go through connected to the seasons.

Contrasting that study, pupils learn about **Animals, including humans**. They learn about animals in the five kingdoms and what similarities and differences they have. Vocabulary such as carnivore, herbivore and omnivore is explicitly taught. They learn humans mammals and about the five senses.

Pupils are introduced to **identifying and classifying materials**. Scientific terms, such as transparent, translucent and opaque are taught explicitly through vocabulary instruction and pupils make further sense by applying it to what they know and then to working and thinking scientifically tasks. This substantive knowledge is enriched by pupils use of disciplinary knowledge through scientific enquiry.

To sophisticate their understanding, Year 1 pupils revisit the study **Animals, including humans** as a retrieval module and deepen their knowledge through revisiting and thinking hard through increasingly challenging tasks.

As pupils progress through KS1, new knowledge is integrated with pre-existing understanding. For example, in Year 2, the study of **Living things and their habitats** and **Uses of everyday materials**, engages pupils to integrate and draw upon their knowledge of **Animals, including humans** as well as **Plants**, and the study of **Materials**. New substantive knowledge is constructed and made sense of through **Working and Thinking scientifically** tasks.

KEY STAGE 2



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Substantive knowledge is always present and acts as a precursor for pupils' understanding. This will enable them to successfully apply disciplinary knowledge. In KS2 we introduced disciplinary scientific terms, including:

- variable
- independent variable
- dependent variable
- controlled variable

These give structure to working and thinking scientifically tasks in relation to the substantive knowledge taught in that specific study.

“what scientists observe, or choose to control in an experiment, depends on what they know. For example, classifying flowering plants scientifically requires knowledge of floral parts to place specimens in appropriate groups. However, classifying insects requires knowledge of body parts.”

Ofsted Research Series: Science, 2021

In KS2 Science, we have defined these terms:

- **variable** - the things that can change in a science experiment
- **independent variable** - the *variable* that is changed by the scientist
- **dependent variables** - are the things that the scientist watches closely for to see how they *respond* to the change made to the *independent* variable
- **controlled variables** - the things that a scientist wants to remain the same and not change so they can see how the independent variable reacts.

LOWER KEY STAGE 2

The unit on **Rocks** is studied and connected with prior knowledge from 'Everyday materials' in KS1. A study of **Animals, including humans** is built upon from KS1 and contrasts the physical features with the functions they perform, including the skeleton and muscles.

Rocks is revisited again to sophisticate and deepen pupils' knowledge, advancing their understanding.

Forces and magnets are introduced and connect with KS1 materials, including twisting, bending and squashing. Contact and non-contact forces are taught and understanding applied through Working and Thinking Scientifically. The abstract concept of **Light** is made concrete through knowing about light sources and shadows.

Plants are studied to develop a more sophisticated understanding of their parts and functions, including pollination.



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A study of **Living things and their habitats** pays close attention to classification and is directly taught using prior knowledge to ensure conceptual frameworks are secure. Explicit vocabulary instruction supports pupils to deconstruct words for their component meaning, for example invertebrate. **Animals, plants and environments** are connected in this study with a summary focusing on positive and negative change.

Electricity is introduced. Substantive knowledge is taught so that pupils acquire understanding about electrical sources, safety and components of a single loop circuit. Practical tasks give pupils the opportunity to think using disciplinary knowledge in the context of variables. Pupils make sense of what they know by testing, proving and disproving hypotheses.

Animals, including humans focuses on the sequence of digestion, from the mouth to excretion. Misconceptions, such as digestion begins in the stomach, are pre-empted, limited and represented as non-examples.

States of matter and **Sound** are taught using knowledge of the particle theory. Acquiring substantive knowledge about 'states' of matter supports pupils to understand how solids, liquids and gases behave. This knowledge is connected further to geographical studies of the **Water cycle** and life processes. Practical scientific tasks and tests help pupils build a coherent understanding of the particle theory by applying what they know through structured scientific enquiry. Misconceptions, such as 'liquid particles are slightly more separated than gas and less compacted than solids' are addressed.

UPPER KEY STAGE 2

In the study of **Properties and changes of materials**, it is important that pupils reuse and draw upon their understanding of states of matter. This prior content eases the load on the working memory to process and make sense of new knowledge, including solutions, mixtures, reversible and irreversible changes.

Change is also studied within **Animals, including humans**, focusing on growth and development of humans and animals.

Earth in Space develops the conceptual understanding of our place in the universe. This study unwraps misconceptions, including the Moon changing shape, the Sun moving across the sky and how seasons occur.

A study of **Forces** sophisticates the substantive knowledge acquired in KS1 and LKS2. New content, including air resistance and water resistance is studied. Force multipliers, such as levers are studied to understand how we can be efficient with effort. For example, a spanner with a long handle multiplies the force and makes it easier to turn a bolt than spanner with a shorter handle. Simple machines, such as pulleys are also studied as force multipliers – they move the load through a greater distance with the same energy being used. Enhancing this study of **Forces**, pupils learn about Galileo Galilei 1564 - 1642 (considered the father of modern science).

Living things and their habitats focuses on differences in life cycles of living things and how they reproduce. This study also contrasts previous scientific thinking. Pupils contrast how people in the past thought and constructed understanding, in the absence of scientific evidence, to explain things they didn't understand. Maria Merion is the significant scientist studied, she observed closely and carefully drew insects undergoing biochemical metamorphosis. David Attenborough describes Maria Marion as one of the most important contributors to the field of entomology.

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A further study of **Living things and their habitats** enables pupils in UKS2 to revisit and add to their understanding of classification through the taxonomy created by Carl Linnaeus. More complex animals are studied, including invertebrates such as Myriapods and Echinodermata (starfish and Sea urchins) as well as Arthropods such as Crustacea, Arachnids, and Insects.

Light is revisited and taught with advanced substantive knowledge. This is physics study with a focus on the properties of light, not the biology of the eye.

The study of **Animals, including humans** enables pupils to add new knowledge to their mental models of biological systems. Circulation, the components of blood and the mechanism of the heart is connected to healthy living through diet and exercise. Many of these science studies are enriched and conceptual frameworks extended through the deliberate curriculum choice to study charts and graphs in Maths, food in Design Technology or reuse and retrieve substantive knowledge in other contexts, such as in writing.

Further retrieval learning modules are deployed, so that pupil knowledge can be advanced and sophisticated to increase their depth of understanding.

Electricity is enhanced with an advanced study of electrical circuits. New substantive knowledge is acquired in the context the particle theory, which was previously studied. Working and thinking scientifically tasks help to deepen and make sense of new learning, such as the concept of electricity and the way we explain it using terms such as charge, potential difference and flow.

Evolution and inheritance introduces two significant scientists - Charles Darwin and Alfred Wallace as pioneers of scientific thinking in the field of evolution. This study draws on how misconceptions may have been arrived at to explain the past and how theories explain significant change, over time. Substantive concepts, including adaption and variation are taught explicitly through vocabulary and clarity is achieved through worked examples. This supports pupils to use this substantive knowledge in a disciplinary way.

Science Curriculum in Detail (using CUSP resources)

Yr group, Unit Title	Substantive concept	Previous Learning	National Curriculum – Learning Questions	Tier 2 Vocabulary	Tier 3 Vocabulary
Y1 Everyday materials	Chemistry	EYFS - The Natural World 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	Pupils should be taught to: <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 	Absorb Rough Smooth Waterproof Metal plastic	Materials Property Flexible Transparent Opaque physical



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		<p>processes and changes in the natural world around them, including the seasons and changing states of matter.</p> <p>EYFS Creating with materials Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; Share their creations, explaining the process they have used; Make use of props and materials when role playing characters in narratives and stories.</p>	<ul style="list-style-type: none"> describe the simple physical properties of a variety of everyday materials compare and group together a variety of everyday materials on the basis of their simple physical properties <p>What are materials? What are things made of in school? How can I describe materials? Which materials are waterproof and which are not? What's the best material for the job and why?</p>		
Y1 Animal including humans	Biology	<p>EYFS — The Natural World They talk about the features of their own immediate environment and how environments might vary from one another</p> <p>similarities and differences in relation to places, objects, materials and living things</p> <p>They make observations of animals and plants and explain why some things occur and talk about changes.</p>	<p>Pupils should be taught to:</p> <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 <p>What is an animal? What types of animals are there? What is similar and what is different? What does food tell us about an animal?</p>	<p>Blood Senses Young Feather Fur scales</p>	<p>Mammal Amphibian Reptile Herbivore Carnivore omnivore</p>
Y1 Plants including trees	Biology	<p>EYFS: The Natural World</p> <p>Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>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</p>	<p>Pupils should be taught to:</p> <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 <p>What are the parts of a plant? What are wild plants and where do you find them? What are garden plants and where do you find them? What makes a tree? What types of trees are there? (around my school) What's the difference between trees?</p>	<p>Bud Trunk Branch Bark Seed wild</p>	<p>Nutrients Stem Deciduous evergreen</p>



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		Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.			
Y1 Changes Introduce seasons and weather Day and night	Physics	<p>EYFS - The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>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.</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>	<p>Pupils should be taught to:</p> <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 <p>What are the four seasons? What's the weather like in Autumn, Spring and Summer? Why does day become night?</p>	<p>Dawn Dusk Mild Rotate Soaked weather</p>	<p>Month Season Spring Summer Autumn Winter</p>
Y1 Revisit Plants, including trees	Biology	<p>EYFS: The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>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</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>	<p>Pupils should be taught to:</p> <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 <p>What do I remember about plants? Remember: What are the parts of a plant? Remember: What are deciduous and evergreen trees?</p>	<p>Bud Trunk Branch Bark Seed wild</p>	<p>Nutrients Stem Deciduous evergreen</p>

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Yr group, Unit Title	Substantive concept	Previous Learning	National Curriculum – Learning Questions	Tier 2 Vocabulary	Tier 3 Vocabulary
Y2 Introduce Use of Everyday materials		<p>EYFS -The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter</p> <p>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</p> <p>Y1 – Everyday materials</p>	<p>Pupils should be taught to:</p> <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 • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching <p>What are materials used for? Categorise and compare wood, metal, plastic and glass. What are materials used for? Categorise and compare ceramics, rock, paper and card, and fabric. What happens when we squash, bend, twist or stretch a material? What’s the right material for the job? What’s the most absorbent material? Who invented waterproofing? Learn about Charles Mackintosh</p>	<p>artificial inflexible manufactured natural brittle extracted fabric</p>	<p>Ceramic Durable Inflexible Reflective Rigid translucent</p>
Y2 Introduce Living things and their habitats	Biology	<p>EYFS: The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter</p> <p>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.</p>	<p>Pupils should be taught to:</p> <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 • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food <p>What is alive and what is not?</p>	<p>Thrive Depend Producer Consume Prey predator</p>	<p>Oxygen Nutrient Respiration Sensitivity Reproduction excretion</p>



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		<p>Year 1 Plants Everyday materials Animals, including humans</p>	<p>What do all living things have in common? Where do plants and animals live? What plants and animals live in our local environment? What are food chains? How are they connected? Why do plants and animals need each other?</p>		
<p>Y2 Introduce Animals, including humans</p>	Biology	<p>Y1 - Animals including humans Introduction and revisit. Y2 - Living things and their habitats. Y1 – Plants Y2 – Plants and bulbs</p>	<p>Pupils should be taught to:</p> <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 <p>REMEMBER: what is an animal? How do animals change as they mature? How do we change as we mature? What do all animals have to do to stay alive? Keeping healthy – why do we exercise? Keeping healthy – why do we eat different types of food?</p>	<p>Healthy Survive Exercise Heart Lungs muscles</p>	<p>Hygiene Lava Pupa Vertebrates Invertebrates metamorphosis</p>
<p>Y2 Introduce Plants</p>	Biology	<p>Y1 Science Animals and living things Y1 Science Plants Y2 Science Living things and habitats</p>	<p>Pupils should be taught to:</p> <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 <p>How do seeds germinate and what happens? What happens when bulbs sprout? What do plants need to thrive and be healthy? What can happen if plants don't get the things they need? What do I notice about plants around the school? How are they healthy? How are they unhealthy? Show what you know How do seeds and bulbs grow? What do plants need to be healthy?</p>	<p>Wither Dormant Mature Bulb Anchor sustain</p>	<p>Germination Perennial Carbon dioxide Glucose clone</p>



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<p>Y2 Revisit</p> <p>Everyday materials</p> <p>(Y2 retrieval unit)</p>	<p>Chemistry</p>	<p>EYFS -The World Children know about similarities and differences in relation to places, objects, materials and living things</p> <p>Y1 Science Properties of materials</p>	<p>Pupils should be taught to:</p> <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 • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching <p>REMEMBER IT – what are everyday materials and how are they used?</p> <p>APPLY IT – why do you think materials should and should not be used for certain jobs?</p> <p>PROVE IT – what is the hardest and softest material? P199 Essential Primary Science</p>	<p>Extracted inflexible Brittle Polished Durable artificial</p>	<p>Sturdy Tough Flexible Fragile versatile</p>
<p>Y2 Revisit</p> <p>Living things and their habitats</p>	<p>Biology</p>	<p>Y1 Science Animals and living things Revisited Summer</p> <p>Y1 Science Plants Revisited Summer</p> <p>Y2 Science Living things and their habitats</p>	<p>Pupils should be taught to:</p> <p>Living things and their habitats</p> <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 • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food <p>Remember - what is alive and what is not? What do all living things have in common? Remember - where do plants and animals live? Remember - what are food chains?</p>	<p>Stalk Thrive Consume</p> <p>Require Identify approach</p>	
<p>Y2 Revisit</p>	<p>Biology</p>	<p>Y2 Science Living things and habitats</p> <p>Y2 Science Plants</p>	<p>Pupils should be taught about plants:</p> <ul style="list-style-type: none"> • observe and describe how seeds and bulbs grow into mature plants 		

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<p>Plants and Animals including humans</p>		<p>Year 2 Science Animals, including humans</p>	<ul style="list-style-type: none"> • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy <p>Pupils should be taught about animals, including humans:</p> <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 <p>PLANTS EXPLAIN-IT • How do seeds and bulbs grow?</p> <ul style="list-style-type: none"> • Complete knowledge organiser on P27 and flick back to check. Use knowledge note 1 to support explanations through organisational or explanative drawings. Try using sentence stems, such as I know... Download and select questions from the Socrative Quiz to test pupil retention. <p>2. ANIMALS (Page 29 and 30) SUMMARISE-IT • What do I know about animals, including humans?</p> <ul style="list-style-type: none"> • Complete knowledge organiser and use knowledge notes to elaborate. Use knowledge note 2 to engage pupils in retrieval practice – model going back to prior learning and using what you know. You could ask pupils to verbally explain characteristics of animals or explain through a diagram using drawings and annotations as cues. You could provide diagrams of life cycles that are completed and ask pupils to explain similarities and differences between how animals change as they grow older or link to life cycles. Download and select questions from the Socrative Quiz to test pupil retention. <p>3. PLANTS and ANIMALS (Page 31) INTERLEAVING EXPLAIN-IT • What do plants need to thrive and be healthy? This could be a guided or independent activity to draw on prior learning and explain in their own way.</p>		
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			ELABORATE-IT • What do I know about animals, including humans? Download and select questions from the Socrative Quiz to test pupil retention.		
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Yr group, Unit Title	Substantive concept	Previous Learning	National Curriculum – Learning Questions	Tier 2 Vocabulary	Tier 3 Vocabulary
Y3 Introduce Animals including humans	Biology	Year 1 Animals including humans Introduction Year 2 Animals including humans Introduction Year 1 Animals including humans revisit	Pupils should be taught to: <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 What effect does the food we eat have? Where is my skeleton and what does it do? Where are my muscles and what do they do?	Minerals Skelton Skull Voluntary Involuntary nerves	Biceps Triceps Vertebra vitamins proteins carbohydrates
Y3 Introduce Forces and Magnets	Physics	Year 1 Everyday materials Year 2 Uses of everyday materials	Forces and magnets <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 What are contact forces? How do surfaces affect the motion of an object? How does friction affect moving objects?	Consequences Contact Force Attract North south	Magnet Resistance Friction Repel Pole Magnetic field

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			<p>What is a non-contact force? How is this different to a contact force? How do magnets attract and repel? Which materials are magnetic? Forces and magnetism summary</p>		
<p>Y3 Introduce Plants</p>	<p>Biology</p>	<p>Year 2 Plants and bulbs Year 3 Animals, including humans</p>	<p>Pupils should be taught to:</p> <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 <p>What are the parts of a flowering plant? What do they do? Do all plants need the same things to thrive and grow? How do leaves make food for the plant? How does water move through a plant? What do flowers do? What is pollination?</p>	<p>Adapt Essential Glucose Transport Variety vital</p>	<p>Transpiration Stoma Pollination Stamen Pistil Photosynthesis</p>
<p>Y3 Introduce Rocks</p>	<p>Chemistry</p>	<p>Year 1 Everyday materials Year 2 Uses of everyday materials</p>	<p>Rocks Pupils should be taught to:</p> <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 <p>How are rocks formed? What types of rocks are there? Can rocks change? How can we test a rock to see if it is limestone or chalk? Is soil just dirt? What makes soil? How are fossils formed? Optional Elaborate and remember rocks, soils and fossils</p>	<p>cemented compacted inorganic matter transform</p>	<p>metamorphic sedimentary igneous fossil magma minerals</p>

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Y3 Introduce Light	Physics	Year 3 Animals, including humans Forces and magnets Y3 Plants	<p>Pupils should be taught to:</p> <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 <p>Do we need light to see things? Remember: what are light sources and what are not light sources? How are shadows formed? What happens to the size of a shadow when the object moves closer to, or away from, the light source?</p>	Absence Cast (shadow) Impenetrable Reflect Shadow Source (light)	Constant dependent Independent Illuminate Translucent Variable
Y3 Revisit and Retrieve Rocks	Chemistry	Year 1 Everyday materials Year 2 Uses of everyday materials	<p>Rocks Pupils should be taught to:</p> <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 <p>How are rocks formed and what types are there? Remember: how can rocks change? Remember: how are fossils formed and how do we know?</p>	cemented compacted inorganic matter transform	metamorphic sedimentary igneous fossil magma minerals

Yr group, Unit Title	Substantive concept	Previous Learning	National Curriculum – Learning Questions	Tier 2 Vocabulary	Tier 3 Vocabulary
Y4 Introduce Animals, including	biology	Year 1 Animals, including humans animals, senses, body parts Year 2 Animals, including humans offspring, basic needs, exercise	<p>Animals, including humans</p> <ul style="list-style-type: none"> • identify the different types of teeth in humans and their simple functions • describe the simple functions of the basic parts of the digestive system in humans 	Expel Compact Digestion Acid Stomach intestines	Incisor Canine Molar Enzyme Saliva Peristalsis



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humans (Teeth, digestion and food chains)		Year 3 Animals, including humans nutrition, skeleton	<ul style="list-style-type: none"> construct and interpret a variety of food chains, identifying producers, predators and prey <p>What teeth do humans have? What do they do? How does our mouth and teeth help digestion? What's the process? Can teeth tell us what animals eat?</p>		
Y4 Introduce Sound	Physics	Year 3 Light	<p>Pupils should be taught to:</p> <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 <p>What is sound? Remember particles from states of matter How does sound travel? What is the pitch and loudness of sound?</p>	Produce Property Source Frequent Regular affect	Vibrate Pitch Volume Medium Vacuum Sound wave
Y4 Introduce Electricity	Physics	Year 3 Light reflection, sources and shadows Year 3 Forces and magnets forces attract and repel	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit recognise some common conductors and insulators, and associate metals with being good conductors 	Associate Identify Portable Effect series	component electrical insulator electrical conductor hypothesis variable

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			<p>What appliances use electricity? What sort of power makes them work?</p> <p>Notice it – what are the everyday appliances that run on electricity - battery or mains?</p> <p>Name it - what are the components in a simple series circuit?</p> <p>Test it – what happens when a circuit is open or closed? (High volume practice using similar question types)</p> <p>Diagnose it – what are the effects of changing circuit components and batteries?</p>		
Y4	Chemistry	<p>Year 3 Light Forces and magnets</p> <p>Year 4 Geography Water Cycle</p> <p>Year 4 - Electricity</p>	<p>Pupils should be taught to:</p> <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 <p>What is matter? What does 'state' mean?</p> <p>What are solids, liquids and gases?</p> <p>Melting: how do materials change state? Evaporating: how do materials change state? Condensing: how do materials change state? Summary: how do materials change?</p>	<p>Permanent</p> <p>Particle</p> <p>Solid</p> <p>Liquid</p> <p>Gas</p> <p>vapour</p>	<p>Evaporate</p> <p>Condense</p> <p>Melt</p> <p>Matter</p> <p>State</p> <p>volume</p>
Y4		<p>Year 3 Rocks</p> <p>Year 3 Animals, including humans</p> <p>Year 3 Plants</p>	<p>Pupils should be taught to:</p> <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 <p>What are the characteristics of living things What animals are vertebrates?</p> <p>What animals are invertebrates?</p>	<p>Classification</p> <p>Environment</p> <p>Interdependence</p> <p>Interact</p> <p>Beneficial</p> <p>Hierarchy</p>	<p>Vertebrate</p> <p>Invertebrate</p> <p>Biotic</p> <p>Ecosystem</p> <p>Species</p> <p>niche</p>

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			<p>What groups are plants classified in? What is classification? How do I use a key? What happens if the environment in a habitat changes?</p>		
<p>Y4</p> <p>Revisit</p> <p>Living things and their habitats</p>	<p>Biology</p>	<p>Year 3 Rocks</p> <p>Year 3 Animals, including humans</p> <p>Year 3 Plants</p>	<p>Pupils should be taught to:</p> <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 <p>What animals are vertebrates and invertebrates? What groups are plants classified in? Explain it: what's a classification key and how do you use it?</p>	<p>Classification</p> <p>Environment</p> <p>Interdependence</p> <p>Interact</p> <p>Beneficial</p> <p>Hierarchy</p>	<p>Vertebrate</p> <p>Invertebrate</p> <p>Biotic</p> <p>Ecosystem</p> <p>Species</p> <p>niche</p>

Yr group, Unit Title	Substantive concept	Previous Learning	National Curriculum – Learning Questions	Tier 2 Vocabulary	Tier 3 Vocabulary
<p>Y5</p> <p>Introduce</p> <p>Living things and their habitats</p>	<p>Biology</p>	<p>Year 4 Living things and their habitats</p> <p>Year 4 Animals, including humans</p> <p>Year 4 Plants</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • describe the life process of reproduction in some plants and animals <p>Life cycle differences – what's the difference between a mammal and an amphibian? Life cycle differences – what's the difference between an insect and a bird? What is similar and what is different between the life cycles of a mammal, an insect, an amphibian and a bird? Summer birds – who was Maria Merion and what did she do? The science of life - how do living things reproduce? Plants and animals: what's the life process of reproduction?</p>	<p>Deduce</p> <p>Process</p> <p>Re-form</p> <p>Adolescence</p> <p>Transform</p> <p>Contrast</p>	<p>Embryo</p> <p>Sexual</p> <p>Metamorphosis</p> <p>biochemical</p> <p>Incubate</p> <p>Fertilisation</p>

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<p>Y5</p> <p>Introduce</p> <p>Earth and Space</p>	<p>Physics</p>	<p>Year 4 Light</p>	<p>Earth and Space</p> <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, the Earth and the Moon as approximately spherical bodies • use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky <p>What are the planets in our solar system? How does our view of the Moon change in a lunar month? Why does the rotation of Earth result in night and day? Why is the Earth's tilt (axis) responsible for the seasons? Review and summarise - present what you know about Earth and Space</p>	<p>Luminous Phenomena Attraction Approximately Relative apparent</p>	<p>Orbit Axis Crescent Gravitational Waning Waxing</p>
<p>Y5</p> <p>Introduce</p> <p>Properties and changes of materials</p>	<p>Chemistry</p>	<p>Science / Geography Y4 Water cycle</p> <p>Science Y4 Electricity Science Y4 States of matter</p> <p>Science Y5 Earth and space</p>	<p>Pupils should be taught to:</p> <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 knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • demonstrate that dissolving, mixing and changes of state are reversible changes • explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda <p>What properties do materials have? How do we use them? What is a solution and what is a mixture?</p>	<p>Property Particle Separate Combine Recover comparative</p>	<p>Atom Molecules Chemical (changes) Physical (changes) Reversible reaction</p>

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			<p>How can we separate materials from a mixture? How can we separate materials from a solution? What changes are reversible? What changes are irreversible?</p>		
<p>Y5 Introduce Forces</p>	<p>Physics</p>	<p>Science Y3 Forces Science Y4 Electricity States of matter Sound Science Y5 Earth and space Y5 Properties and changes of materials</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • identify the effects of air resistance, water resistance and friction, that act between moving surfaces • recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect <p>Remember gravity When is friction helpful and when is it not? What's the effect of air resistance? What's the effect of water resistance? How do levers help us? How do pulleys and gears help us? Who was Galileo Galilei?</p>	<p>Opposite Reaction Advantage Displace Weight mass</p>	<p>Pulley Gear Pivot Fulcrum Lever upthrust</p>
<p>Y5 Introduce Animal, including Humans</p>	<p>Biology</p>	<p>Year 2 Animals, including humans notice that animals, including humans, have offspring which grow into adults Year 3 Animals, including humans skeletons for growth and support</p>	<p>Pupils should be taught to describe the changes as humans develop to old age</p> <ul style="list-style-type: none"> • Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty. • Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows. <p>What is the human timeline? How do we change into adults? How does human and animal lifespan compare?</p>	<p>Development Unique Diverse Generation Mature Equipped</p>	<p>Adolescence Puberty Gestation Embryo Foetus womb</p>
<p>Y5 Revisit</p>	<p>Biology</p>	<p>Year 4 Living things and their habitats Year 4 Animals, including humans</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird 	<p>Development Unique Diverse Generation</p>	<p>Adolescence Puberty Gestation Embryo</p>



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Living things and their habitats		Year 4 Plants	<ul style="list-style-type: none"> describe the life process of reproduction in some plants and animals <p>Life cycles: what's the difference between an insect and an amphibian?</p> <p>What is similar and what is different between the life cycles of an insect and an amphibian?</p> <p>Remember plants: what's the process of reproduction?</p>	Mature Equipped	Foetus womb
Y5 2 nd Revisit Living things and their habitats	Biology	Year 4 Living things and their habitats Year 4 Animals, including humans Year 4 Plants	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird describe the life process of reproduction in some plants and animals <p>SELECT and ORGANISE information</p> <p>DESIGN and CREATE animal information using explanative response frameworks</p> <p>COMPARE differences between animals using organisational (relational) response frameworks</p>		

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Y6 Introduce Living things and their habitats	Biology	Year 4 Living things and their habitats Year 5 Living things and their habitats Year 5 Animals, including humans	<p>Pupils should be taught to:</p> <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 specific characteristics 	Characteristics Interdependence Specific Categorise Primitive Hierarchy	Fungus Arthropod Taxonomy Kingdom Phylum genus

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			<p>Who was the scientist Carl Linnaeus and what did he do?</p> <p>How do we classify vertebrates? How do we classify invertebrates we know? How do we classify invertebrates we don't know? (Sponges, Jellyfish and Flatworms) How do we classify invertebrates we don't know? (Starfish and Sea urchins, Crustacea and Myriapoda)</p> <p>Apply it: what animals can I classify? What animals and plants exist in my local environment?</p>		
Y6	Biology	<p>Science Y3 Rocks Geography</p> <p>Y4 Water cycle Science</p> <p>Y5 Life cycles and reproduction Science Y5 Animals, including humans Science Y5 Properties and changes of materials Science</p> <p>Y6 Classification</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution <p>How have living things changed over time? How do we know?</p> <p>How has life evolved over time?</p> <p>What is DNA and what does it do? Working scientifically Are all offspring identical to their parents?</p> <p>Darwin and Wallace – what evidence did they share to argue the case for evolution?</p> <p>Survival of the fittest - how have animals adapted and evolved to suit their environment?</p>	<p>Characteristics Adaptation Acquire Theory Modify generation</p>	<p>Evolve Survival Species Clone Inherit fossil</p>

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<p>Y6 Introduce Light</p>	<p>Physics</p>	<p>Year 3 Light reflection, sources and shadows</p> <p>Year 3 Forces and magnets forces attract and repel</p> <p>Year 4 Sound source, vibrations, pitch and volume</p> <p>Year 4 Electricity series circuits and elements</p>	<p>Pupils should be taught to:</p> <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 the circuit • compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches use recognised symbols when representing a simple circuit in a diagram <p>What is electricity? How does it work? Do it - How do we build and represent a series circuit?</p> <p>What are the components in a series circuit? Test it - How does the number of cells and voltage affect components in a circuit?</p> <p>Diagnose it – what are the effects and consequences of changing circuit components and batteries?</p>	<p>Component Consequence Proton Neutron Systematic Represent Source Generate</p>	<p>Proton Neutron Electron Terminal; Series voltage</p>
<p>Y6 Introduce Electricity</p>	<p>Physics</p>	<p>Year 3 Light reflection, sources and shadows</p> <p>Year 3 Forces and magnets forces attract and repel</p> <p>Year 4 Sound source, vibrations, pitch and volume Year 4 Electricity series circuits and elements</p>	<p>Pupils should be taught to:</p> <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 the circuit • compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches use recognised symbols when representing a simple circuit in a diagram <p>What is electricity? How does it work? Do it - How do we build and represent a series circuit?</p> <p>What are the components in a series circuit? Test it - How does the number of cells and voltage affect components in a circuit?</p> <p>Diagnose it – what are the effects and consequences of changing circuit components and batteries?</p>	<p>Component Consequence Systematic Represent Source Generate</p>	<p>Proton Neutron electron Terminal Series voltage</p>



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<p>Y6 Introduce</p> <p>Animals, including humans (Circulatory System)</p>	<p>Biology</p>	<p>Year 3 Animal, including humans nutrition, skeletons and muscles</p> <p>Year 4 Animal, including humans teeth, digestion and food chains</p> <p>Year 5 Animal, including humans changes as humans develop to old age</p>	<p>Animals, including humans</p> <ul style="list-style-type: none"> • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • describe the ways in which nutrients and water are transported within animals, including humans <p>What is blood made of and why do we need it? Why do our bodies need nutrients and how are they transported? What is our circulatory system? What is our heart like inside? How does it work? Who influenced what we know about our circulatory system? What can we do to keep healthy? Present and explain what we know about the circulatory system, nutrients and keeping healthy</p>	<p>Cell Chamber System Circulation Vessel Clot</p>	<p>Plasma Platelet Artery Capillary Vein ventricle</p>
<p>Y6 Introduce</p> <p>Animals, including humans: water transportation</p>	<p>Biology</p>	<p>Year 3 Animal, including humans nutrition, skeletons and muscles</p> <p>Year 4 Animal, including humans teeth, digestion and food chains</p> <p>Year 5 Animal, including humans changes as humans develop to old age</p> <p>Year 6 Animal, including humans circularity system</p>	<p>Animals, including humans</p> <ul style="list-style-type: none"> • describe the ways in which nutrients and water are transported within animals, including humans <p>Remember circulation and digestion: how are these two systems connected?</p> <p>Where are the kidneys and what do they do?</p> <p>How do kidneys keep us healthy?</p>	<p>Filter Expel Substance Function Regulate transform</p>	<p>Kidney Bladder Urine Excretion Toxin Nutrient</p>