



Science Coverage and Progression Framework **For EYFS, Key Stage 1 & Key Stage 2 2024 - Version 2**

SCIENCE CURRICULUM INTENT

The Aims of the National Curriculum for Science:

The national curriculum for Science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.



Overview	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	
EYFS Nursery	All about Me What's outside? Exploring nature	Terrific Tales Senses	Ticket to Ride How do things work?	Come Outside Plants – life cycle of a plant	Science Fortnight – linked to BSW	Amazing Animals Identifying animals and their homes	Fun at the Seaside Exploring different types of materials.
EYFS Reception	All about Me What's outside? Naming and recognising nature/wildlife	Terrific Tales Seasons and Forces	Ticket to Ride Recycling/Changes in material/Magnets	Come Outside Plants – how to grow and take care of plants noticing changes		Amazing Animals What do animals need to survive?	Fun at the Seaside How to take care of the environment
Year 1	Seasonal changes– Autumn Animals inc. Humans Biology & Physics	Animals inc. Humans Biology	Seasonal changes– Winter Materials Physics & Chemistry	Seasonal changes– Spring Materials Physics & Chemistry		Seasonal changes– Summer Plants Physics & Biology	Plants Biology
Year 2	Living Things and their habitats Biology	Materials Physics & Chemistry	Animals inc. Humans Biology	Animals inc. Humans (ext unit) Biology		Plants Biology	Plants (ext unit) Biology
Year 3	Rocks and Soils Physics & Chemistry	Animals inc. Humans Biology	Forces Physics	Light Physics		Plants Biology	Plants Biology
Year 4	Living Things and their habitats Biology	Electricity Physics	Animals Incl Humans Digestive System Biology	States of Matter Physics & Chemistry		States of Matter Physics & Chemistry	Sound Physics
Year 5	Forces Physics	Materials Physics & Chemistry	Earth and Space Physics & Chemistry	Earth and Space Physics & Chemistry		Living Things and their habitats Biology	Animals inc. humans Biology
Year 6	Light Physics	Electricity Physics	Living things and their habitats Biology	Evolution and Inheritance Biology		Science Fortnight – linked to BSW	Animals inc. humans Biology



EYFS FS1- Nursery: All about me (Autumn 1) What's outside? Exploring nature			
<ul style="list-style-type: none"> Children will become familiar with the outdoor environment including local sounds and the nature within the grounds. 			
By the end of this unit, children should know: (substantive/key knowledge)		By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:	
<ul style="list-style-type: none"> FM Children will talk about what they notice about the weather on a daily basis and how this impacts them. (need a coat, gloves, sunhat etc.) (Geog/sci) 		<ul style="list-style-type: none"> FM Children will describe what they see, hear and feel whilst outside (sci) FM Children will describe what they see, hear and feel whilst outside (sci) 	
Sticky Knowledge		Vocabulary	
<ul style="list-style-type: none"> I know that we have trees in the school grounds. I know that I need to wear a coat if it's cold. I know that I need to wear wellies if it's wet. I can listen to the different sounds outside. I can spy trees, bushes, leaves and flowers. 		<ul style="list-style-type: none"> nature, tree, trunk, branch, leaves, bushes, flowers, listen, sounds, cold and wet 	
Future learning			
<ul style="list-style-type: none"> Understand the key features of the life cycle of a plant and an animal. (Nursery – Plants & Animals, excluding humans) Explore the natural world around them. (Reception – Seasonal changes) Describe what they see, hear and feel whilst outside. (Reception – Seasonal changes) Understand the effect of changing seasons on the natural world around them. (Reception – Seasonal changes) 			
EYFS Explorify links	Zoom in, Zoom out	What just happened?	What just happened?
	https://explorify.uk/en/activities/zoom-in-zoom-out/black-bumps	https://explorify.uk/en/activities/what-just-happened/caterpillar-changes	https://explorify.uk/en/activities/whats-going-on/woodlice-exploring

EYFS FS2- Reception: Marvelous Me Outside (Autumn 1) What's outside? Naming and recognising nature/wildlife
<ul style="list-style-type: none"> Children will become familiar with the characteristics of the outdoor environment including local sounds and the nature. This will include the trees and wildlife within the school grounds.



By the end of this unit, children should know: (substantive/key knowledge)		By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:	
<ul style="list-style-type: none"> • FM Children will talk about what they notice about the weather on a daily basis and how this impacts them. (need a coat, gloves, sunhat etc.) (Geog/sci) • SM Children will begin to understand the need to respect and care for the natural environment and all living things. (sci) 		<ul style="list-style-type: none"> • FM Children will describe what they see, hear and feel whilst outside (sci) • FM Children will describe what they see, hear and feel whilst outside (sci) • FM Children will explore collections of materials with similar and/or different properties. (sci) • SM Children will talk about what they see or hear, using a wide vocabulary. (sci) 	
Sticky Knowledge		Vocabulary	
<ul style="list-style-type: none"> • I know that leaves have different features and can talk about the shape and colours they see. • I know that the sounds outside will be different to the sounds inside. • I can sort leaves. • I can identify different sounds. • I can see patterns on tree trunks. 		<ul style="list-style-type: none"> • smell, sight, touch, senses, care, natural, nature, living, sort and features, tree, trunk, branch, roots, leaves, smooth, rough. 	
Future learning			
<ul style="list-style-type: none"> • <i>Understand the key features of the life cycle of a plant and an animal. (Nursery – Plants & Animals, excluding humans)</i> • <i>Explore the natural world around them. (Reception – Seasonal changes)</i> • <i>Describe what they see, hear and feel whilst outside. (Reception – Seasonal changes)</i> • <i>Understand the effect of changing seasons on the natural world around them. (Reception – Seasonal changes)</i> 			
EYFS Explorify links	Listen, what can you hear?	Zoom in, zoom out	What's going on?
	https://explorify.uk/en/activities/listen-what-can-you-hear/part-of-the-family	https://explorify.uk/en/activities/zoom-in-zoom-out/thin-strands	https://explorify.uk/en/activities/whats-going-on/slugs-galore



<ul style="list-style-type: none"> Children will be able to use their senses to explore both inside and outside identifying through touch, taste, smell and sight. Talk about how the outdoor environment changes and we know this by using our senses. 											
<p>By the end of this unit, children should know: (substantive/key knowledge)</p>		<p>By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:</p>									
<ul style="list-style-type: none"> Children will know what each of their senses are 		<ul style="list-style-type: none"> FM Children will use all their senses in hands on exploration of natural materials. FM Children will explore collections of materials with similar and/or different properties. FM Children will be able to tell someone about what they see. 									
<p>Sticky Knowledge</p>		<p>Vocabulary</p>									
<ul style="list-style-type: none"> I can say what I feel. I can say what I smell. I can say what I see. I can say what I taste. I can say what I hear. I can identify which sense I use. I can observe what I see/hear/smell/touch and taste. 		<ul style="list-style-type: none"> soft, hard, cold, warm, crunchy, chewy, fresh, sweet, smelly, loud, quiet, long, short, tall, small 									
<p>Future learning</p> <ul style="list-style-type: none"> 											
<table border="1"> <tr> <td>EYFS Explorify links</td> <td>Zoom in, zoom out</td> <td>Listen, what can you hear?</td> <td>zoom in, zoom out</td> </tr> <tr> <td></td> <td>https://explorify.uk/en/activities/zoom-in-zoom-out/spiky-spikes</td> <td>https://explorify.uk/en/activities/listen-what-can-you-hear/out-and-about</td> <td>https://explorify.uk/en/activities/zoom-in-zoom-out/watery-home</td> </tr> </table>				EYFS Explorify links	Zoom in, zoom out	Listen, what can you hear?	zoom in, zoom out		https://explorify.uk/en/activities/zoom-in-zoom-out/spiky-spikes	https://explorify.uk/en/activities/listen-what-can-you-hear/out-and-about	https://explorify.uk/en/activities/zoom-in-zoom-out/watery-home
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<ul style="list-style-type: none"> • Children will be able to name the four seasons. Spring, Summer, Winter Autumn. Talk about how the outdoor environment looks different during each season. They will be able to compare and notice the changes. • Children will be able to talk about the opposite forces push and pull. They will explore the forces during planned opportunities and begin to predict what might happen. 	
<p>By the end of this unit, children should know: (substantive/key knowledge)</p>	<p>By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:</p>
<ul style="list-style-type: none"> • SM Children will talk about the differences between materials and changes they notice. • SM Children will explore and talk about different forces they can feel. • SM Children will explore how and begin to understand why certain materials are better to use for different things. (Sci) • TM Children will begin to understand that when water gets cold enough it freezes and becomes ice. (Sci) • SM Children will begin to understand the need to respect and care for the natural environment and all living things. 	<ul style="list-style-type: none"> • SM Children will explore and talk about different forces they can feel. • TM Children can identify that certain UK animals live in certain habitats/environments (Geog and Sci) • TM Children will notice and talk about what happens to puddles when it's cold. (Sci)
<p>Sticky Knowledge</p>	<p>Vocabulary</p>
<ul style="list-style-type: none"> • I can talk name the seasons and some their similarities and differences. • I can explain what different forces feels like. • I can observe how puddles disappear/ evaporate over time. • I can observe how ice melts over time. • I can identify the material for a comfy bed. • I can identify the material for a strong bridge. 	<ul style="list-style-type: none"> • smell, sight, touch, senses, care, natural, nature, living, sort and features, tree, trunk, branch, roots, leaves, smooth, rough, investigate, experiment, observe, season, predict, materials, evaporate, freeze, forces, push, pull, wind.
<p>Future learning</p> <ul style="list-style-type: none"> • <i>Compare how things move on different surfaces. (Y3 - Forces and magnets)</i> • <i>Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets)</i> • <i>Observe how magnets attract or repel each other and attract some materials and not others. (Y3 - Forces and magnets)</i> • <i>Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials. (Y3 - Forces and magnets)</i> 	



EYFS Explorify links	zoom in, zoom out	What just happened?	Zoom in, zoom out
	https://explorify.uk/en/activities/zoom-in-zoom-out/sparkly-brown	https://explorify.uk/en/activities/what-just-happened/let-it-snow	https://explorify.uk/en/activities/zoom-in-zoom-out/yellow-moves

EYFS FS1- Nursery: Ticket To Ride (Spring 1) How do things work?			
<ul style="list-style-type: none"> • Children will be able to explore and talk about the different forces they can feel. • Children will be able to explore how things work linked to transport topic. 			
By the end of this unit, children should know: (substantive/key knowledge)		By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:	
<ul style="list-style-type: none"> • Children will be able to explain how things move • Children will know and able to name some effects forces have on materials 		<ul style="list-style-type: none"> • Children will explore how things work. (Sci) • Explore and talk about different forces they can feel .e.g. how the water pushes up when they try to push a plastic boat under it (Sci) 	
Sticky Knowledge		Vocabulary	
<ul style="list-style-type: none"> • I can say how things move • I can identify which forces are used. • I can use forces to make items move. 		<ul style="list-style-type: none"> • push, pull, soft, hard, how, why, when, force 	
Future learning			
<ul style="list-style-type: none"> • <i>Compare how things move on different surfaces. (Y3 - Forces and magnets)</i> • <i>Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets)</i> • <i>Observe how magnets attract or repel each other and attract some materials and not others. (Y3 - Forces and magnets)</i> • <i>Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials. (Y3 - Forces and magnets)</i> • <i>Describe magnets as having two poles. (Y3 - Forces and magnets)</i> • <i>Predict whether two magnets will attract or repel each other, depending on which poles are facing. (Y3 - Forces and magnets)</i> 			
EYFS Explorify links	What's going on?	Listen, what can you hear?	Zoom in, zoom out



	https://explorify.uk/en/activities/whats-going-on/does-it-float	https://explorify.uk/en/activities/listen-what-can-you-hear/up-along-and-down	https://explorify.uk/en/activities/zoom-in-zoom-out/shiny-stripes
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EYFS FS2- Reception: Ticket To Ride (Spring 1) <i>Recycling/Changes in material/Magnets</i>	
<ul style="list-style-type: none"> • Children will be able to name different materials to recycle. • Children will be able to identify which items are magnetic. • Children will know when water starts to melt and know how to make water into ice going from liquid to solid. 	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) <i>Possible evidence:</i>
<ul style="list-style-type: none"> • Children will begin to understand that when water gets cold enough it freezes and becomes ice. (Sci) • Children will begin to understand that when ice warms up it melts and changes back to water. (Sci) 	<ul style="list-style-type: none"> • Children can identify and sort different materials to be recycled. (Sci) • Children begin to understand how magnets work and use this to sort what is or isn't metal. (Sci)
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • I can talk about the different materials we can recycle. • I begin to ask simple questions about what is going on and make simple observations. • I can evaluate my findings. • I can identify different materials to recycle such as plastic and cardboard. • I can observe how water can freeze solid. • I can observe how ice melts over time. • I can sort items which are magnetic by testing using magnets. 	<ul style="list-style-type: none"> • magnets, magnetic, sort, recycle, reuse, plastic, cardboard, paper, tin, metal, freeze, melt, liquid, solid.
Future learning	
<ul style="list-style-type: none"> • <i>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)</i> • <i>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of</i> 	



everyday materials)

- 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. (Y3 - Forces and magnets)
- Compare and group materials together, according to whether they are solids, liquids or gases. (Y4 - States of matter)
- 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). (Y4 - States of matter)

EYFS Explorify links	What's going on?	Zoom in, zoom out	Zoom in, zoom out
	https://explorify.uk/en/activities/whats-going-on/magnets	https://explorify.uk/en/activities/zoom-in-zoom-out/in-the-fields	https://explorify.uk/en/activities/zoom-in-zoom-out/protective-layers

EYFS FS1- Nursery: Come Outside (Spring 2) Plants – life cycle of a plant	
<ul style="list-style-type: none"> • Children will know the lifecycle of a chick. • Children will be able to name woodland animals and know that they live in woodland areas. 	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:
<ul style="list-style-type: none"> • TM Understand the key features of the life cycle of a plant and an animal. (Sci) • N2 Children will recognise and name some common woodland animals: hedgehog, squirrel, rabbit, fox, badger etc. (Sci) 	<ul style="list-style-type: none"> • N1 Talk about what they see, using a wide vocabulary such as the different leaves they can see on welly wander • Children will discuss that certain animals live in woodland/forests (UK) (Sci) • N1 TM Show curiosity, appreciation and respect for living things.
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • I know that chicks come from eggs. • I know that a seed grows into a plant. • I know that animals live in different places such as a woodland area. • I can sort animals into woodland and not woodland animals. 	<ul style="list-style-type: none"> • lifecycle, hatching, incubation, woodland, fox, badger, rabbit, hedgehog,



<ul style="list-style-type: none"> • I can talk about the lifecycle of a chick. 			
Future learning <ul style="list-style-type: none"> • <i>Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants)</i> • <i>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants)</i> • <i>Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)</i> • <i>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. (Y3 - Plants)</i> • <i>Investigate the way in which water is transported within plants. (Y3 - Plants)</i> 			
EYFS Explorify links	What just happened?	Zoom in, zoom out	Zoom in, zoom out
	https://explorify.uk/en/activities/what-just-happened/bulb-growing	https://explorify.uk/en/activities/zoom-in-zoom-out/hello-spring	https://explorify.uk/en/activities/zoom-in-zoom-out/sweet-and-shiny

EYFS FS2- Reception: Come Outside (Spring 2) Plants – how to grow and take care of plants noticing changes	
• Children	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:
<ul style="list-style-type: none"> • Children will know that a plant is a living thing. (Sci) • Children understand how certain plants grow and correctly sequence the growth patterns. (Sci) • Children understand how certain animals grow and correctly sequence the growth patterns (Sci) 	<ul style="list-style-type: none"> • Children recognise that different plants and animals grow in different parts of the world. (Geog/Sci) • Children can recognise and name parts of a plant. (Sci) • Children notice and talk about the changes that happen to plants as they grow. (Sci)
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • I know that chicks like humans have a life cycle. • I know that for a seed to grow it needs water, food and sunlight. • I can talk about how plants and animals have life cycles. • I can identify different parts of a plant and name them. 	<ul style="list-style-type: none"> • grow, change, sequence, stem, leaves, roots, care



Future learning			
<ul style="list-style-type: none"> • <i>Observe and describe how seeds and bulbs grow into mature plants. (Y2- Plants)</i> • <i>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants)</i> • <i>Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)</i> • <i>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. (Y3 - Plants)</i> • <i>Investigate the way in which water is transported within plants. (Y3 - Plants)</i> 			
EYFS Explorify links	What just happened?	What just happened?	Zoom in, Zoom out
	https://explorify.uk/en/activities/what-just-happened/apple-orchard	https://explorify.uk/en/activities/what-just-happened/yellow-weeds	https://explorify.uk/en/activities/zoom-in-zoom-out/yellow-sunshine

EYFS FS2- Nursery: Amazing Animals (Summer 1) <i>Identifying animals and their homes</i>	
<ul style="list-style-type: none"> • Children will name and sort animals into zoo animals. Children will know what a zoo is. 	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) <i>Possible evidence:</i>
<ul style="list-style-type: none"> • N1 To name and identify different animals. (sci) • To recognise different animal sounds. (sci) • N2 Children will name and identify zoo animals (sci) 	<ul style="list-style-type: none"> • N2 Children will discuss that certain animals live in the zoo. (sci) • Children will say why animals live in zoos. (sci)
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • I can sort animals into animals which live in zoos. • I can talk about the different animal sounds. • I can talk about how zoos look after animals and keep them safe. 	<ul style="list-style-type: none"> • Lion, giraffe, tiger, monkey, zebra, penguin, bear, endangered, safe, zoo, wild
Future learning	
<ul style="list-style-type: none"> • <i>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals, including humans)</i> • <i>Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans)</i> 	



<ul style="list-style-type: none"> • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 - Animals, including humans) • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans) 			
EYFS Explorify links	zoom in, zoom out	What's going on?	Listen, what can you hear?
	https://explorify.uk/en/activities/zoom-in-zoom-out/grey-scales	https://explorify.uk/en/activities/whats-going-on/foxing-around	https://explorify.uk/en/activities/listen-what-can-you-hear/old-macdonald

EYFS FS2- Reception: Amazing Animals (Summer 1) What do animals need to survive?	
<ul style="list-style-type: none"> • Children will be able to talk about different animals and their habitats. Children will be able to speak about how some animals use camouflage to help them keep safe. 	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:
<ul style="list-style-type: none"> • Children can recognise and name some common Polar and African animals: polar bear, penguin, artic fox, giraffe, zebra monkey, etc. (Sci) • Children begin to understand what impact humans have had on animals and their environments. (Sci) • Children begin to understand about camouflage. (Sci) 	<ul style="list-style-type: none"> • Children will record what they see in the natural world around them through drawings or diagrams. • Children can identify that certain UK animals live in certain habitats/environments (woodland/ farm/sea/ponds) (Geog and Sci) • Children can label the key parts of an animal. (Sci) • Children can identify and sort animals according to where they live. (Sci)
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • I can talk about why different animals live in different environments. • I can identify different animals and say where they live. • I can talk about the different habitats that you might find specific animals. 	<ul style="list-style-type: none"> • habitat, environment, survive, woodland, coast, hot, cold, shelter, camouflage.



<ul style="list-style-type: none"> I can talk about how some animals use camouflage to help survive. 				
Future learning				
<ul style="list-style-type: none"> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals, including humans) Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans) Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 - Animals, including humans) Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans) 				
EYFS Explorify links	Zoom in, zoom out	What's just happened?	What's going on?	What's just happened?
	https://explorify.uk/en/activities/zoom-in-zoom-out/green-scales	https://explorify.uk/en/activities/what-just-happened/whats-in-the-pond	https://explorify.uk/en/activities/whats-going-on/woodlice-exploring	https://explorify.uk/en/activities/what-just-happened/egg-chick-chicken

EYFS FS1- Nursery: Fun at the Seaside (Summer 2) Exploring different types of materials.	
<ul style="list-style-type: none"> Exploring different materials, notice and talk about the differences and sorting materials according to different properties. 	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:
<ul style="list-style-type: none"> N1 Notice differences between objects N2 Talk about the differences between materials and changes they notice. (Sci) 	<ul style="list-style-type: none"> N1 Talk about what they see, using a wide vocabulary N2 Children will explore collections of materials with similar and/or different properties. (sci) N2 Explore how you can shine light through some materials, but not others. Investigate shadows. (Sci)
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> I know that materials can be different I know that materials can be the same I know that light can shine through materials I know that light can be blocked by materials. 	<ul style="list-style-type: none"> sort, difference, same, strong, weak, shadow, light



<ul style="list-style-type: none"> • I can sort materials which are the same and different. • I can check materials to see if you can see through them. 				
Future learning				
<ul style="list-style-type: none"> • <i>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)</i> • <i>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)</i> 				
EYFS Explorify links	Listen, what can you hear?	What just happened?	What just happened?	What's going on?
	https://explorify.uk/en/activities/listen-what-can-you-hear/holiday-time	https://explorify.uk/en/activities/what-just-happened/an-icy-treat	https://explorify.uk/en/activities/what-just-happened/fairy-cakes	https://explorify.uk/en/activities/whats-going-on/bubble-fun

EYFS FS2- Reception: Fun at the Seaside (Summer 2) <i>How to take care of the environment</i>	
<ul style="list-style-type: none"> • Children will identify different parts of the environment. Identifying habitats/environments within the local area. Ways to look after the environment both locally and at the seaside. 	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) <i>Possible evidence:</i>
<ul style="list-style-type: none"> • Children can identify that certain UK animals live in certain habitats/ environments (woodland/ farm/sea/ponds) • Children can recognise and name parts of a plant. (Sci) 	<ul style="list-style-type: none"> • Children will record what they see in the natural world around them through drawings or diagrams. • Children begin to understand what they can do to help the environment.(Sci)
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • I know different environments like the seaside and countryside. • I know how to care for plants. • I know how to care for our school. • I know how to care for our outside area. 	<ul style="list-style-type: none"> • habitat, home, environment, care, pollution



<ul style="list-style-type: none"> • I can identify key features of the seaside and the countryside. • I can keep my environment clean. 			
Future learning			
•			
EYFS Explorify links	Listen, what can you hear?	What just happened?	What's going on?
	https://explorify.uk/en/activities/listen-what-can-you-hear/holiday-time	https://explorify.uk/en/activities/what-just-happened/disappearing-castle	https://explorify.uk/en/activities/whats-going-on/melting-moments

Years 1: Seasonal Changes (Autumn 1) taught alongside Animals Inc. Humans unit across Autumn 1 and Autumn 2	
<ul style="list-style-type: none"> • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies 	
<p>Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets.</p> <p>Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.</p>	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:
<ul style="list-style-type: none"> • Know that there are 4 seasons - Autumn, Winter, Spring and Summer • Know how the environment changes in each season. • Know the types of clothes associated with each season. • Know that the length of daylight varies with Winter having the shortest daylight hours and Summer having the longest. • Know that a thermometer is used to measure temperature • Know that the sun is a star 	<ul style="list-style-type: none"> • Use the evidence gathered to describe the general types of weather and changes in day length over the seasons. • Use their evidence to describe some other features of their surroundings, e.g. themselves, animals, plants that change over the seasons • Demonstrate their knowledge in different ways e.g. making a weather forecast video, writing seasonal poetry, creating seasonal artwork, report on the weather using a pictogram
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • Can name the four seasons and identify when in the year they occur • Can describe weather in different seasons over a year • Can describe days as being longer (in time) in the summer and shorter in the winter 	<ul style="list-style-type: none"> • Autumn, Winter, Spring, Summer, sunny, windy, rainy, snowy, day length, sunrise, sunset, monsoon



<ul style="list-style-type: none"> • Can describe other features that change through the year (but mainly Autumn and Winter) 				
Previous learning <ul style="list-style-type: none"> • Understand the key features of the life cycle of a plant and an animal. (Nursery – Plants & Animals, excluding humans) • Explore the natural world around them. (Reception – Seasonal changes) • Describe what they see, hear and feel whilst outside. (Reception – Seasonal changes) • Understand the effect of changing seasons on the natural world around them. (Reception – Seasonal changes) 		Future learning <ul style="list-style-type: none"> • Seasonal changes: Winter, Spring and Summer (Year 1) 		
Working Scientifically <ul style="list-style-type: none"> • I can explain similarities and differences within the seasons. • I can predict what colours are hiding in my leaf. • I can explain what _____ feels like. • I can record different signs of spring using labelled diagrams and pictures. • I can evaluate my test by suggesting simple improvements • I can ask simple questions about what is going on and make careful observations. 		Enquiry Skills <ul style="list-style-type: none"> • I can identify the four seasons. • I can look for patterns with the colours found in different leaves. • I can observe how crystals form over time. • I can identify signs of spring. • I can compare my results to research about rainfall in different seasons • I can carry out a comparative test. • I can identify different clouds and understand how they are formed. 		
Related scientists		Common Misconceptions <ul style="list-style-type: none"> • it always snows in Winter • it is always sunny in Summer • there are only flowers in Spring and Summer • it rains most in Winter 		
Yrs 1 Explorify links	Observing changes over time https://explorify.uk/en/activities/odd-one-out/sleepy-heads	Noticing patterns https://explorify.uk/en/activities/whats-going-on/wonderful-weather	Grouping and classifying https://explorify.uk/en/activities/have-you-ever/fed-the-birds	Using secondary sources https://explorify.uk/en/activities/odd-one-out/sleepy-heads



<p>Year 1: Animals, including Humans (Autumn 1 & 2 extended unit) taught alongside Seasonal Changes: Autumn across Autumn 1 & 2</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 • 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. 	
<p>Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.</p>	
<p>By the end of this unit, children should know: (substantive/key knowledge)</p>	<p>By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:</p>
<ul style="list-style-type: none"> • Know that animals are grouped together in ‘families’ based on shared properties. • Know why we need the body parts - ears, mouth, eyes, nose, tongue. • Know the location of the brain. • Know which body parts are linked to the senses 	<ul style="list-style-type: none"> • Can sort and group animals using similarities and differences • Can use simple charts etc. to identify unknown animals • Can name body parts correctly when talking about measurements and comparisons e.g. “We both have hands, but his are bigger than mine.” • Can plan an investigation to care for a (toy) animal
<p>Sticky Knowledge</p>	<p>Vocabulary</p>
<ul style="list-style-type: none"> • Can name a range of animals which includes animals from each of the vertebrate groups • Can describe the key features of these named animals • Can identify and name a variety of common animals that are carnivores, herbivores and omnivores • Can identify, name, draw and label the basic parts of the human body and say which part is associated with each sense 	<ul style="list-style-type: none"> • Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, reptile, amphibian, mammal, omnivore, carnivore, herbivore, all five senses.
<p>Previous learning</p>	<p>Future learning</p>
<ul style="list-style-type: none"> • Use all their senses in hands-on exploration of natural materials. (Nursery) • Name and describe people who are familiar to them. (Reception) 	<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. (Y2 - Living things and their habitats) • 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. (Y6 – Living



		<p><i>things and their habitats)</i></p> <ul style="list-style-type: none"> • Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats) 			
Working Scientifically opportunities		Enquiry Skills opportunities			
<ul style="list-style-type: none"> • I can observe features of the human body. • I can carry out simple tests to compare and classify. • I can make predictions when using my senses. • I can ask questions to identify, sort and classify. • I can make comparisons between animals and give my reasons. • I can use sorting rings and Venn diagrams to record my findings. • I can complete a simple table. • I can record my findings using drawings, writing or symbols. • I can observe closely the structure of different minibeasts. • I can closely observe bird characteristics. • I can interpret my results and make simple conclusions. 		<ul style="list-style-type: none"> • I can identify different parts of the human body • I can carry out a comparative test • I can classify animals based on their characteristics. • I can spot patterns between different groups of animals. • I can identify and sort animals according to what they eat. • I can identify how my body moves. • I can identify my 5 senses when exploring the outdoor environment. • I can identify different mini beasts based on observations. • I can research facts about different birds. • I can look for patterns in my data. 			
Related scientists		Common Misconceptions			
<p>Ibn Sina (known also as Avicenna) & David Attenborough Leonardo Da Vinci (<i>Anatomical drawing, 'Vitruvian Man'</i>) Miller Hutchinson (<i>Engineer who invented the first electric hearing aid</i>) Joan Beauchamp Procter (<i>Herpetologist and Curator of Reptiles, London Zoo</i>) Patricia Bath (<i>Ophthalmologist and inventor of using lasers in cataract operations</i>) Tanesha Allen (<i>Zoologist who studies badgers</i>)</p>		<ul style="list-style-type: none"> • All ocean creatures are fish • All fish lay eggs • Differences between vertebrates and invertebrates • All mammals give birth to live young • Spiders are insects or any creepy crawly is an insect • Only large land mammals are animals • Male animals are always bigger and stronger than females 			
Yrs 1 and 2 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
Animals, including humans	Unexpected eggs Looking after baby	Special delivery Prehistoric shapes	Baby animals Hot-steppers Say cheese Spooky animals	Bird feeders How would you make a shelter for a human?	What if humans hibernated? What if my bones were bendy?



					<u>What if we couldn't smell things?</u>
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Year 1: Materials (Spring 1 & 2 extended unit) including Seasonal Changes: Winter & Spring	
<p>• 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. 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>Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets. Chemistry: Chemistry is like a recipe book for everything in the world, showing us how different things mix together to make new things.</p>	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:
<ul style="list-style-type: none"> • Know that matter (stuff) is made from tiny building blocks. This comes in three forms - solids, liquids and gases. • Know that many materials are solid and have different properties. Know that some materials are natural and others are man-made. • Know that plastic is a waterproof material and that it keeps water out • Know that Charles Macintosh invented a method for making a waterproof item of clothing. • Know that John Dunlop invented the inflatable (pneumatic) tyre. • Know that waterproof means something that keep water out e.g. umbrella, raincoat, water bottle • Know examples of waterproof materials • Know that some materials made out of some metals are magnetic • Know some materials that are magnetic • Know that some materials float when they are light (less dense) • Know that some materials sink when they are heavy (dense) 	<ul style="list-style-type: none"> • Can sort objects and materials using a range of properties • Can choose an appropriate method for testing an object for a particular property • Can use their test evidence to answer the questions about properties e.g. "Which cloth is the most absorbent?"



<ul style="list-style-type: none"> • Know some examples of materials that float and sink 	
<p>Sticky Knowledge</p>	<p>Vocabulary</p>
<ul style="list-style-type: none"> • Can describe materials using key property vocabulary • Can say why a material is suitable for its use • Can identify materials with different properties in everyday objects • Can explain the difference between transparent and opaque materials • Can describe the features of Winter and Spring and how it affects our lifestyle choices 	<ul style="list-style-type: none"> • object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through. hard, soft, stretchy, brittle, shiny, dull, squashy, rough, smooth, bendy, waterproof, absorbent, transparent, opaque.
<p>Previous learning</p>	<p>Future learning</p>
<ul style="list-style-type: none"> • <i>Use all their senses in hands-on exploration of natural materials. (Nursery- Materials, including changing materials)</i> • <i>Explore collections of materials with similar and/or different properties. (Nursery - Materials, including changing materials)</i> • <i>Talk about the differences between materials and changes they notice. (Nursery - Materials, including changing materials)</i> • <i>Seasonal changes- Autumn, (Year 1)</i> 	<ul style="list-style-type: none"> • <i>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)</i> • <i>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)</i>
<p>Working Scientifically opportunities</p>	<p>Enquiry Skills opportunities</p>
<ul style="list-style-type: none"> • I can use observations to classify • I can record in a table • I can ask and answer questions • I can perform a simple test • I can make predictions on best materials. • I can evaluate a test • I can predict which materials will be waterproof. • I can evaluate my shelter. • I can test different materials. • I can explain my results. 	<ul style="list-style-type: none"> • Identify materials and classify • Classify based on how they feel. • Compare suitability of materials • Find patterns in test results • I can conduct a comparative test. • I can identify and classify different materials. • I can set up a comparable test. • I observe what happens to the materials over a period of time. • I can notice patterns in my results. • I can use my subject knowledge to sort a range of objects.



<ul style="list-style-type: none"> I can use a sorting diagram to classify materials. I can ask questions to identify materials. 					
Related scientists		Common Misconceptions			
<p>Chester Greenwood (<i>Inventor of earmuffs</i>)</p> <p>Becky Schroeder (<i>Inventor of Glo-sheets which she patented as a 12-year-old</i>)</p>		<ul style="list-style-type: none"> only fabrics are materials only building materials are materials only writing materials are materials the word 'rock' describes an object rather than a material 'solid' is another word for hard. 			
Yrs 1 and 2 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
	<p>Bonkers Bubbles</p> <p>Liquid densities</p>	<p>Burly bridges</p> <p>Functional footwear</p> <p>Protective measures</p>	<p>Unusual houses</p> <p>Wonderful wheels</p> <p>Maritime medley</p> <p>Synthetic selection</p>	<p>Which is the bendiest?</p> <p>Unusual plant pots</p>	<p>What if every material was rigid, or stretchy, or transparent?</p> <p>What if your school banned paper?</p>

Year 1: Plants including Seasonal Changes: Summer (Summer 1 & 2 extended unit)	
<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>Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets.</p> <p>Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.</p>	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:
<ul style="list-style-type: none"> Know the names of the following common plants – e.g. daisy, white clover, poppy, nettle, ivy, bramble and locate some in the local environment. (also dandelion and grass) Know the names of the following common trees - oak, elm, maple, silver birch, sycamore, horse chestnut, crack willow 	<ul style="list-style-type: none"> Can sort and group parts of plants using similarities and differences Can use simple charts etc. to identify plants Can collect information on features that change during the year Can label the different parts of a plant



<ul style="list-style-type: none"> • Know how to identify them from their leaves, fruit and shape using images • Know how to identify some of the trees in the grounds of Penistone St Johns • Know the term deciduous • Know the names of the basic parts of a plant and their function 	
<p>Sticky Knowledge</p>	<p>Vocabulary</p>
<ul style="list-style-type: none"> • <i>Can name trees and other plants that I see regularly</i> • <i>Can describe some of the key features of these trees and plants e.g. the shape of the leaves, the colour of the flower/blossom</i> • <i>Can point out trees which lost their leaves and those that kept them the whole year</i> • <i>Can point to and name the parts of a plant, recognising that they are not always the same e.g. leaves and stems may not be green</i> • Can describe the features of Summer and how it affects our lifestyle choices 	<p>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud.</p> <p>Names of trees in local area, garden and wild flowering plants.</p> <p>deciduous, evergreen,</p>
<p>Previous learning</p>	<p>Future learning</p>
<ul style="list-style-type: none"> • <i>Plant seeds and care for growing plants. (Nursery – Plants)</i> • Understand the key features of the life cycle of a plant and an animal. (Nursery – Plants) • Begin to understand the need to respect and care for the natural environment and all living things. (Nursery – Plants) • Explore the natural world around them. (Reception – Living things and their habitats) • Recognise some environments that are different to the one in which they live. (Reception – Living things and their habitats) 	<ul style="list-style-type: none"> • <i>Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants)</i> • <i>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants)</i> • <i>Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)</i> • <i>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. (Y3 - Plants)</i> • <i>Investigate the way in which water is transported within plants. (Y3 - Plants)</i>
<p>Working Scientifically opportunities</p>	<p>Enquiry Skills opportunities</p>
<ul style="list-style-type: none"> • I can make careful observations. 	<ul style="list-style-type: none"> • I can find out how long different fruits and vegetables take to grow.



<ul style="list-style-type: none"> • I can keep a diary to explain how a seed grows. • I can carefully draw and label a plant. • I can label parts of a plant. • I can make comparisons between animals and give my reasons. • I can make simple predictions 		<ul style="list-style-type: none"> • I can observe seed growth over time. • I can identify plants in the environment. • I can identify and classify parts of the plant. • I can spot patterns between different groups of animals. • I can observe types of leaves over time. 			
Related scientists		Common Misconceptions			
Maria Sibylla Merian (<i>German artist, scientific illustrator, and naturalist</i>)					
Yrs 1 and 2 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
	<u>Rich pickings</u> <u>Spring flowers</u> <u>Shooting sprouts</u>	<u>Types of apple</u> <u>Winter scenes</u> <u>Brown and sticky</u>	<u>Timewarp plants</u> <u>Types of leaves</u> <u>Brill gills</u> <u>Curious crown</u>	<u>Do you need big seeds to grow big plants?</u>	<u>What if plants could move from one place to another?</u>

Year 2: Living Things and their Habitats (Autumn 1)	
<ul style="list-style-type: none"> • <i>Explore and compare the differences between things that are living, dead, and things that have never been alive</i> • <i>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</i> • <i>Identify and name a variety of plants and animals in their habitats, including micro-habitats</i> • <i>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</i> 	
Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:
<ul style="list-style-type: none"> • To know which items, including those made from a variety of materials, fit into each category and place them in a table under the headings living, dead, and things that have never been alive. 	<ul style="list-style-type: none"> • <i>Can sort into living, dead and never lived</i> • <i>Can give key features that mean the animal or plant is suited to its micro-habitat</i> • <i>Using a food chain can explain what animals eat</i> • <i>Can explain in simple terms why an animal or plant is suited to a habitat</i>



<ul style="list-style-type: none"> • Know the acronym MRS NERG (Movement, Respiratory, Sensitivity, Nutrition, Excretion, Reproduction and Growth) to teach about how to organise objects into each category. • Know that all creatures need air, food, shelter and water to survive • Know that animals and plants survive in a habitat because of each other and that different plants and animals live in different places because of their needs. • Know the names of minibeasts 	<p><i>e.g. the caterpillar cannot live under the soil like a worm as it needs fresh leaves to eat; the seaweed we found on the beach cannot live in our pond because it is not salty</i></p>
<p>Sticky Knowledge</p>	<p>Vocabulary</p>
<ul style="list-style-type: none"> • <i>Can find a range of items outside that are living, dead and never lived</i> • <i>Can name a range of animals and plants that live in a habitat and micro-habitats that they have studied</i> • <i>Can talk about how the features of these animals and plants make them suitable to the habitat</i> • <i>Can construct a food chain that starts with a plant and has the arrows pointing in the correct direction</i> 	<ul style="list-style-type: none"> • Living, dead, never been alive, suited, suitable, basic need, food, food chain, shelter, move, feed, names of local habitats, biome, organism, names of micro habitats
<p>Previous learning</p>	<p>Future learning</p>
<ul style="list-style-type: none"> • <i>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants)</i> • <i>Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)</i> • <i>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans)</i> • <i>Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans)</i> • <i>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans)</i> • <i>Observe changes across the four seasons. (Y1 - Seasonal changes)</i> 	<ul style="list-style-type: none"> • <i>Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats)</i> • <i>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 – Living things and their habitats)</i> • <i>Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)</i> • <i>Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans)</i>
<p>Working Scientifically opportunities</p>	<p>Enquiry Skills opportunities</p>



<ul style="list-style-type: none"> • I can ask questions about where the object came from. • I can draw basic conclusions using own scientific knowledge, observations and comparisons. • I can record my observations using labelled drawings • I can record my findings using tables and pictograms. • I can interpret my results and create an environment suitable for my animal. • I can communicate my findings using relevant scientific language and illustrations. 		<ul style="list-style-type: none"> • I can identify and classify objects that are alive, dead and never been alive. • I can identify which habitat each animal lives in. • I can research facts about my animal using observations and secondary resources. • I can look for patterns in my data as to where different minibeasts live. • I can use secondary sources to find out what animals eat to make a food chain. 		
Related scientists		Common Misconceptions		
<p><i>William Kirby (Father of modern entomology, the study of insects)</i> <i>Prem Singh Gill (Polar Scientist who studies where Antarctic seals live, breed and feed, so we can know more about where they prefer to live)</i> <i>Dawood Qureshi (Marine Biologist who studies wildlife in the ocean)</i></p>		<ul style="list-style-type: none"> • Fire is living • Plants and seeds are not alive because they don't move • Arrows in a food chain means 'eat' • An animals habitat is like its home 		
Yrs 1 and 2 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Using secondary sources
Living things and habitats (biodiversity and interdependence)	Sandy adventurers	Busy bee	Australian animals Mystery markings Savannah sidekicks	How would you survive in a rainforest?

Year 2: Materials (Autumn 2)	
<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>Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets.</p> <p>Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.</p>	



By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:
<ul style="list-style-type: none"> • Know that matter (stuff) is made from tiny building blocks. • Know the following properties of materials • Know which materials have these properties • Know why some materials are not appropriate • Know that materials can change shape when properties are flexible and soft but they can't change shape when the properties are rigid, hard and stiff. 	<ul style="list-style-type: none"> • • Can sort materials using a range of properties • Can explain using the key properties why a material is suitable or not suitable for a purpose • Can begin to choose an appropriate method for testing a material for a particular property • Can use their test evidence to select appropriate material for a purpose e.g. Which material is the best for a rain hat?
Sticky Knowledge	Vocabulary
<p>-Can name an object, say what material it is made from, identify its properties, and make a link between the properties and a particular use</p> <p>-Can use the words flexible and/or stretchy to describe materials that can be changed in shape and stiff and/or rigid for those that cannot</p> <p>-Can recognise that a material may come in different forms which have different properties</p>	<ul style="list-style-type: none"> • materials, suitability, properties, waterproof, shock absorbent, reflective, squash, bend, twist, stretch, push, pull, squeeze, wood, paper, brick, cardboard, plastic, fabric, metal, rubber, glass, stone
Previous learning	Future learning
<ul style="list-style-type: none"> • Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) • Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials) 	<ul style="list-style-type: none"> • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks) • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets) • 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. (Y5 - Properties and changes of materials) • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (Y5 - Properties and changes of materials)
Working Scientifically opportunities	Enquiry Skills opportunities



<ul style="list-style-type: none"> • I can identify and classify materials. • I can draw labelled diagrams. • I can draw basic conclusions. • I can carry out simple comparative tests. • I can predict the best material - test how an item moves on different surfaces - sandpaper, carpet, paper, plastic and bubble wrap. Make predictions and test items made from different materials against 4 forces - squashing, bending, twisting and stretching • I can evaluate findings of tests 		<ul style="list-style-type: none"> • Know how to compare and group materials - Know how to use a Venn diagram to sort a set of materials (e.g., one circle labelled 'flexible' and the other circle labelled 'opaque') • I can identify materials • I can use research for understanding. • I can carry out comparative tests. • I can notice patterns between materials. 			
Related scientists		Common Misconceptions			
<p>Isambard Kingdom Brunel <i>Charles Macintosh (Chemist and inventor of waterproof clothing)</i> <i>John McAdam (Inventor of the modern road surface)</i> <i>Victoria Callaghan (Develops sustainable packaging for BASF plc)</i> <i>Dr Pearl Agyakwa (Materials scientist who studies why some materials wear out and other don't)</i></p>		<ul style="list-style-type: none"> • only fabrics are materials • only building materials are materials • only writing materials are materials • the word rock describes an object rather than a material • solid is another word for hard 			
Yrs 1 and 2 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
Materials	Bonkers Bubbles Liquid densities	Burly bridges Functional footwear Protective measures	Unusual houses Wonderful wheels Maritime medley Synthetic selection	Which is the bendiest? Unusual plant pots	What if every material was rigid , or stretchy , or transparent ? What if your school banned paper?

Year 2: Animals including Humans (Spring 1 & Spring 2 extended unit)
<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.
Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.



By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) <i>Possible evidence:</i>
<ul style="list-style-type: none"> • Know animals and their babies and identify them in photos • Know that animals grow and change over their lifetime. • Know that animals grow in a womb, and are born or hatch. • Know the life cycle of a chicken - egg, chick, chicken and the life cycle of a frog • Know that animals and humans need water, food and air to survive (relate to looking after pets) • Know that humans need exercise to stay fit and healthy • Know that a balanced diet consists of the five food groups • Know that sugary soft drinks can damage teeth and contain sugar which can be harmful to the body and cause weight gain. • Know that a germ is 'a very small living thing that causes disease'. Know that they are only visible through a microscope. • Know basic hygiene rules to prevent the spread of germs 	<ul style="list-style-type: none"> • <i>Can describe, including using diagrams, the life cycle of some animals, including humans, and their growth to adults e.g. by creating a timeline of their lives</i> • <i>Show what they know about looking after a baby/animal by creating a parenting/pet owners' guide/poster</i> • <i>Explain how exercise helps humans to keep fit and healthy through recording pulse after different physical activities</i>
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • <i>Can describe how animals, including humans, have offspring which grow into adults, using the appropriate names for the stages</i> • <i>Can state the basic needs of animals, including humans, for survival</i> • <i>Can state the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</i> • <i>Can name foods in each section of the healthy eating pyramid</i> 	<p>offspring, grow, adults, nutrition, reproduce, survival, water, food, air, exercise, hygiene.</p>
Previous learning	Future learning
<ul style="list-style-type: none"> • <i>Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans)</i> • <i>Identify, name, draw and label the basic parts of the human body and say</i> 	<ul style="list-style-type: none"> • <i>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. (Y3 - Animals, including humans)</i> • <i>Describe the differences in the life cycles of a mammal, an amphibian, an</i>



<p><i>which part of the body is associated with each sense. (Y1 - Animals, including humans)</i></p>		<p><i>insect and a bird. (Y5 - Living things and their habitats)</i></p> <ul style="list-style-type: none"> • Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats) • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans) 			
<p>Working Scientifically opportunities</p> <ul style="list-style-type: none"> • I can identify a variety of animals and match to its offspring. • I can communicate findings using correct scientific language and illustrations. • I can ask simple questions relevant to the topic. • I can communicate how you can look after different animals based on what they eat and where they live. • I can plan and carry out simple tests. • I can sort foods into their food groups and record my results. • I can use drawings and art to represent my knowledge of a balanced diet. • I can make simple predictions from what I have observed. • I can communicate my findings using models. • I can evaluate a comparative test. • I can answer questions using my scientific knowledge and vocabulary. 		<p>Enquiry Skills opportunities</p> <ul style="list-style-type: none"> • Look for patterns in animals • Observe lifecycle over time • Research acts about animals • Identify foods animals eat • Set up comparable test • Identify and classify foods 			
<p>Related scientists</p> <p><u>Elizabeth Garrett Anderson</u> <i>(First English woman to qualify as a doctor)</i></p> <p><u>Dr Kelly Blacklock</u> <i>(Veterinary Surgeon)</i></p> <p><u>Daniella Dos Santos</u> <i>(Veterinary Surgeon)</i></p>		<p>Common Misconceptions</p> <ul style="list-style-type: none"> • an animal's habitat is like its 'home' • all animals that live in the sea are fish • respiration is breathing • breathing is respiration. 			
<p>Yrs 1 and 2 Explorify links</p> <p>Animals, including humans</p>	<p>Observing changes over time</p> <p><u>Unexpected eggs</u> <u>Looking after baby</u></p>	<p>Noticing patterns</p> <p><u>Special delivery</u> <u>Prehistoric shapes</u></p>	<p>Grouping and classifying</p> <p><u>Baby animals</u> <u>Hot-steppers</u> <u>Say cheese</u> <u>Spooky animals</u></p>	<p>Comparative or fair tests</p> <p><u>Bird feeders</u> <u>How would you make a shelter for a human?</u></p>	<p>Using secondary sources</p> <p><u>What if humans hibernated?</u> <u>What if my bones were bendy?</u></p>



					What if we couldn't smell things?
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Year 2: Plants (Summer 1 & 2 extended unit)	
<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>Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.</p>	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:
<ul style="list-style-type: none"> • Know that roots support the plant in the ground and absorb water and nutrients needed for growth. • Know that leaves are made to catch sunlight and change the sun's energy • Know that the flower is where seeds are made • Know the lifecycle of a plant eg. sunflower or dandelion 	<ul style="list-style-type: none"> • Can spot similarities and difference between bulbs and seeds • Can nurture seeds and bulbs into mature plants identifying the different requirements of different plants • Can explain the process of a plant's life cycle
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • Can describe how plants that they have grown from seeds and bulbs have developed over time • Can identify plants that grew well in different conditions • Can name and label different parts of the plant and their uses ie: roots are used to collect water from the soil 	<p>Leaf, flower, blossom, bud, petal, berry, root, seed, stalk, trunk, branch, stem, bark, fruit, light, shade, sun, warm, cool, water, grow, healthy, germinate, climate, nutrients.</p>
Previous learning	Future learning
<ul style="list-style-type: none"> • Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) • Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) 	<ul style="list-style-type: none"> • Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. (Y3 - Plants) • 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. (Y3 - Plants)



		<ul style="list-style-type: none"> • Investigate the way in which water is transported within plants. (Y3 - Plants) • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants) 			
Working Scientifically opportunities		Enquiry Skills opportunities			
<ul style="list-style-type: none"> • I can identify and labels parts of a plant. • I can make observations on how plants grow and offer explanations. • I can use a Venn diagram to sort and classify seeds in different ways. • I can identify a range of plant seeds using my observations. • I can make basic predictions and explain my reasons. • I can carry out simple tests. • I can communicate clearly what a plant needs to grow. • I can ask simple questions to investigate • I can evaluate my test and suggest simple improvements. • I can observe how different plants grow in different climates. • I can record my results in a table. 		<ul style="list-style-type: none"> • I can identify and classify parts of a flower. • I can observe how plants grow over time. • I can sort and classify seeds using my own criteria. • I can Identify plants in the natural environment. • I can observe plants growing over time. • I can carry out a comparative test. • I can record my observations after 2 weeks. • I can look for patterns in my tests. • I can look for patterns in my results and explain the changes. • I can research how plants survive in different conditions. • I can identify and classify different trees or foods. 			
Related scientists		Common Misconceptions			
<p>Daniel Solander <i>(Botanist who worked with Joseph Banks on Captain Cook's voyage around the World)</i></p> <p>Joseph Banks <i>(Naturalist on Captain Cook's voyage around the World)</i></p> <p>Thomas Wyatt Turner <i>(Botanist who studied plant disease)</i></p> <p>Poppy Okotcha <i>(Horticulturalist interested in the connection between healthy environments, healthy food, and healthier people)</i></p> <p>Dr Ben Woodcock <i>(Ecological Entomologist who helps farmers grow food, so it is safe for insects and other wildlife)</i></p> <p>Angie Burnett <i>(Plant Biologist who grows plants and sees how they react to different conditions that make it more difficult for them to grow)</i></p>					
Yrs 1 and 2 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources



Plants	Rich pickings Spring flowers Shooting sprouts	Types of apple Winter scenes Brown and sticky	Timewarp plants Types of leaves Brill gills Curious crown	Do you need big seeds to grow big plants?	What if plants could move from one place to another?
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Year 3: Rocks and Soils (Autumn 1)	
<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>Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets.</p> <p>Chemistry: Chemistry is like a recipe book for everything in the world, showing us how different things mix together to make new things.</p>	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:
<ul style="list-style-type: none"> • Know the three natural types of rocks: igneous, sedimentary and metamorphic • Know that a fossil is the hard remains of a prehistoric animal or plant that are found inside a rock • Know the sequence of fossil formation as – • Animal dies and is buried by sediment • Soft parts of the animal decay or decompose • More sediment builds up around the animal and is compressed to form rock • Bones start to be dissolved by water underground • Minerals in the water then turn to rock. • Know that soil is a mixture of air, water, broken down rock matter and other organic material (dead or living animal tissue) 	<ul style="list-style-type: none"> • Can classify rocks in a range of different ways, using appropriate vocabulary • Can devise tests to explore the properties of rocks and use data to rank the rocks • Can link rocks changing over time with their properties e.g. soft rocks get worn away more easily • Can present in different ways their understanding of how fossils are formed e.g. in role play, comic strip, chronological report, stop-go animation etc. • Can identify plant/animal matter and rocks in samples of soil • Can devise a test to explore the water retention of soils
Sticky Knowledge	Vocabulary



<ul style="list-style-type: none"> • Can name some types of rock and give physical features of each • Can explain how a fossil is formed • Can explain that soils are made from rocks and also contain living/dead matter 	<ul style="list-style-type: none"> • Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb, water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil.
<p>Previous learning</p>	<p>Future learning</p>
<ul style="list-style-type: none"> • Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) • Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials) • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials) 	<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. (Y6 - Evolution and inheritance) • The composition of the Earth. (KS3) • The structure of the Earth. (KS3) • The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. (KS3)
<p>Working Scientifically opportunities</p>	<p>Enquiry Skills opportunities</p>
<ul style="list-style-type: none"> • I can make careful observations and identify similarities and differences. • I can record my classifications in a table, Venn diagram or Carrol diagram. • I can record my results in a table and rank my rocks to answer enquiries. • I can interpret the process of fossilisation using a model and pictures. • I can ask questions to deepen my learning about rock formation • I can set up tests to answer questions. 	<ul style="list-style-type: none"> • I can compare and group materials together depending on their properties. • I can classify rocks using their properties • I can sort and classify materials into magnetic and non-magnetic. • I can research and learn about significant scientists in history. (Mary Anning) • I use research and models to help demonstrate my learning. • I can make systematic and careful observations over time.
<p>Related scientists</p>	<p>Common Misconceptions</p>



<p>William Smith (<i>Engineer & Geologist who developed the science of rock strata</i>) James Hutton (<i>Scientist who studied rocks and the effects of natural processes on them, such as rain, running water, tides, and volcanoes, on the development of the Earth</i>) Florence Bascom (<i>Geologist who studied the origin and formation of mountains</i>) Anjana Khatwa (<i>Geologist who collects rocks and fossils from the beach and studies them to learn about the creatures that lived in the sea and on Earth over 150 million years ago</i>) Brianna Green (<i>Biogeochemist who collects soil to see what kind of living things are in it to study the effects of climate change</i>)</p>					
<ul style="list-style-type: none"> • 'Stones' and 'pebbles' are small pieces of rock • The word 'stone' can be used instead of 'rock' • That permeable means waterproof • Soil and compost are the same thing • A fossil is an actual piece of the extinct animal or plant • Rocks are all hard • Concrete and bricks are rock • Any artefacts, e.g old coins are fossils 					
Yr 3 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
Rocks	Sandcastle	Bubbly water	Mysterious material Kaleidoscope of colour Surprising surface	Which rock would be best for a skate ramp?	Do rocks stay the same for ever?

Year 3: Animals inc. Humans (Autumn 2)	
<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. 	
Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) <i>Possible evidence:</i>
<ul style="list-style-type: none"> • Animals, including humans, need food, water and air to survive. • Know that humans need a balanced diet, water, air, exercise and good hygiene to be healthy. • Know that different food types provide different benefits for humans. 	<ul style="list-style-type: none"> • Can classify food into those that are high or low in particular nutrients • Can answer their questions about nutrients in food, based on their gathered evidence • Can talk about the nutrient content of their daily plan



<ul style="list-style-type: none"> • Know that vitamins are substances that you need in order to remain healthy which are found • in foods. • Meat, fish and eggs provide protein and Milk, cheese and yoghurt provide calcium, • Know what a human skeleton looks like. Name key parts • Know that mammals have skeletons and that a human is a type of mammal. • Know that humans have muscles 	<ul style="list-style-type: none"> • <i>Can give similarities e.g. they all have joints to help the animal move, and differences between skeletons</i>
<p>Sticky Knowledge</p>	<p>Vocabulary</p>
<ul style="list-style-type: none"> • <i>Can name the nutrients found in food</i> • <i>Can state that to be healthy we need to eat the right types of food to give us the correct amount of these nutrients</i> • <i>Can name some bones that make up their skeleton, giving examples that support, help them move or provide protection</i> • <i>Can describe how muscles and joints help them to move</i> 	<ul style="list-style-type: none"> • vertebrate, bones, skeleton, backbone (spine), muscle, healthy, exercise, hygiene, disease, balanced diet
<p>Previous learning</p>	<p>Future learning</p>
<ul style="list-style-type: none"> • <i>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals, including humans)</i> • <i>Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans)</i> • <i>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 - Animals, including humans)</i> • <i>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans)</i> • <i>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans)</i> 	<ul style="list-style-type: none"> • <i>Describe the simple functions of the basic parts of the digestive system in humans. (Y4 - Animals, including humans)</i> • <i>Identify the different types of teeth in humans and their simple functions. (Y4 - Animals, including humans)</i> • <i>Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans)</i> • <i>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans)</i>
<p>Working Scientifically opportunities</p>	<p>Enquiry Skills opportunities</p>



<ul style="list-style-type: none"> • Locate and label the bones in the body • I can answer questions about the uses of our bones. • Record using labelled drawings and scientific language. • I can evaluate my design and suggest improvements. • I can make careful observations to sort animals into groups. • I can make predictions from questions raised. • I can use scientific language to discuss ideas. • I can record my results in a table. • I can record my results in a bar chart. • I can evaluate my learning using scientific language. 		<ul style="list-style-type: none"> • Research the bones in the skeletal system. • I can identify and classify parts of the skeletal system. • Identify bones in the body and the hand. • I can look for patterns in how each part of the hand moves and make adjustments. • I can identify and classify animals into vertebrate and invertebrates. • I can look for patterns in results. • I can use secondary sources to find out about muscles. • I can research the nutritional values of foods by reading data. • I can look for patterns and compare nutritional values. • I can identify and classify foods. 			
Related scientists		Common Misconceptions			
<p>Wilhelm Roentgen (<i>Physicist who discovered x-rays</i>)</p> <p>Adelle Davis (<i>Biochemist & Nutritionist who linked health and diet</i>)</p> <p>Michelle Williams (<i>Radiologist</i>)</p>					
Yrs 3 and 4 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
Animals including humans	<p>Thirsty work</p> <p>The damselfly's day</p>	Odd octopus	<p>Topsy turvy</p> <p>Weird walkers</p> <p>Spot the difference</p>	Which breakfast is best?	What if we ate insects?

Year 3: Forces and Magnets (Spring 1)	
<ul style="list-style-type: none"> • <i>Compare how things move on different surfaces.</i> • <i>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</i> <ul style="list-style-type: none"> • <i>Observe how magnets attract or repel each other and attract some materials and not others.</i> • <i>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.</i> • <i>Describe magnets as having two poles.</i> • <i>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</i> 	
<p>Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets.</p>	



By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) <i>Possible evidence:</i>
<ul style="list-style-type: none"> • Know that a force can be thought of as a push or a pull. • Know that there are three types of contact force: • Know that the texture of a surface will affect how another object moves along that surface. • Know that smooth surfaces allow things to move quickly but rougher surfaces create a pull that keeps the object stuck there longer. • Know that the force between two surfaces rubbing together is called friction. • Know that there are also non-contact forces that can act between objects without them touching • Know that a magnet is a piece of iron or other material which attracts some metals towards it • Know that a magnet has two poles - North and South • Know that the word attract means one object pulling another object towards it • Know that repel means one object pushing another object away from it 	<ul style="list-style-type: none"> • <i>Can use their results to describe how objects move on different surfaces</i> • <i>Can use their results to make predictions for further tests e.g. it will spin for longer on this surface than that, but not as long as it spun on that surface</i> • <i>Can use classification evidence to identify that some metals, but not all, are magnetic</i> • <i>Through their exploration, they can show how like poles repel and unlike poles attract, and name unmarked poles</i> • <i>Can use test data to rank magnets</i>
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • <i>Can give examples of objects moving differently on different surfaces</i> • <i>Can name a range of types of magnets and show how the poles attract and repel</i> • <i>Can draw diagrams using arrows to show the attraction and repulsion between the poles of magnets</i> 	<ul style="list-style-type: none"> • force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole.
Previous learning	Future learning
<ul style="list-style-type: none"> • <i>Explore how things work. (Nursery – Forces)</i> • <i>Explore and talk about different forces they can feel. (Nursery – Forces)</i> • <i>Talk about the differences between materials and changes they notice.</i> 	<ul style="list-style-type: none"> • <i>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. (Y5 - Forces)</i>



<p><i>(Nursery – Forces)</i></p> <ul style="list-style-type: none"> • Explore the natural world around them. (Reception – Forces) • Describe what they see, hear and feel whilst outside. (Reception – Forces) • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials) 		<ul style="list-style-type: none"> • Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. (Y5 - Forces) • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. (Y5 - Forces) • Magnetic fields by plotting with compass, representation by field lines. (KS3) • Earth's magnetism, compass, and navigation. (KS3) 			
Working Scientifically opportunities		Enquiry Skills opportunities			
<ul style="list-style-type: none"> • I can observe different forces • I can evaluate my choices and suggest further improvements. • I can predict whether materials are magnetic or not. • I can plan a fair test • I can record my findings using scientific drawings • I can use models to explain findings. 		<ul style="list-style-type: none"> • Group and identify forces based on observations. • Research John McAdam to create own road surfaces • Sort and classify materials into magnetic and non-magnetic. • Carry out a fair test using magnets. • Spot patterns in my drawings and explain what is happening using magnetic fields. • Use research and secondary sources to aid my explanations. 			
Related scientists		Common Misconceptions			
<p>William Gilbert (<i>Doctor who developed the theory of magnetism</i>) Leonardo Da Vinci (<i>First person to plan and carry out tests on friction</i>) Eric Laithwaite (<i>Electrical Engineer who developed the technology behind the Maglev train</i>)</p>		<ul style="list-style-type: none"> • the bigger the magnet the stronger it is • all metals are magnetic. 			
Yr 3 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
Forces and magnets	Dancing raisins Egg in bottle	Magnets There's a hole in my bottle	River crossing Moving propellers	Rocket launchers, Marbles Newspaper towers	What if all transport was electric?



<ul style="list-style-type: none"> • • <i>Recognise that they need light in order to see things, and that dark is the absence of light.</i> <ul style="list-style-type: none"> • <i>Notice that light is reflected from surfaces.</i> • <i>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</i> • <i>Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</i> <ul style="list-style-type: none"> • <i>Find patterns in the way that the size of shadows change.</i> 	
<p>Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets.</p>	
<p>By the end of this unit, children should know: (substantive/key knowledge)</p>	<p>By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:</p>
<ul style="list-style-type: none"> • Know that light is a form of energy • Know that we need light to see things and that darkness is the absence of light • Know that light travels in straight lines • Know that light is reflected from surfaces (smooth, shiny surfaces reflect light more efficiently), and is not the producer of the light source itself. • Know that there are man-made sources of light such as light bulbs, televisions, neon signs. • Understand that shadows are formed when an opaque object blocks light from passing through 	<ul style="list-style-type: none"> • <i>Can describe patterns in visibility of different objects in different lighting conditions and predict which will be more or less visible as conditions change</i> • <i>Can clearly explain, giving examples, that objects are not visible in complete darkness</i> • <i>Can describe and demonstrate how shadows are formed by blocking light</i> • <i>Can describe, demonstrate and make predictions about patterns in how shadows vary</i>
<p>Sticky Knowledge</p>	<p>Vocabulary</p>
<ul style="list-style-type: none"> • <i>Can describe how we see objects in light and can describe dark as the absence of light</i> • <i>Can state that it is dangerous to view the sun directly and state precautions used to view the sun, for example in eclipses</i> • <i>Can define transparent, translucent, and opaque</i> • <i>Can describe how shadows are formed</i> 	<ul style="list-style-type: none"> • Light, Dark, Shadow, Reflection, Opaque, Natural, Man-made, Light Source, Dull, Shiny, Observation, Translucent, Transparent
<p>Previous learning</p>	<p>Future learning</p>
<ul style="list-style-type: none"> • <i>Explore how things work. (Nursery – Light)</i> • <i>Talk about the differences in materials and changes they notice. (Nursery)</i> 	<ul style="list-style-type: none"> • <i>Recognise that light appears to travel in straight lines. (Y6 - Light)</i> • <i>Use the idea that light travels in straight lines to explain that objects are</i>



<p>– <i>Light</i>)</p> <ul style="list-style-type: none"> • Describe what they see, hear and feel whilst outside. (Reception – Light) • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials) 		<p>seen because they give out or reflect light into the eye. (Y6 - Light)</p> <ul style="list-style-type: none"> • 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. (Y6 - Light) • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. (Y6 - Light) 			
<p>Working Scientifically opportunities</p> <ul style="list-style-type: none"> • I can raise own questions when exploring materials and light. • I can make predictions based on scientific questions. • I can set up practical comparative tests using my own ideas. • I can record my results in a table. • I can interpret my results and report on patterns found. • I can evaluate my test and suggest improvements. • I can observe what happens when the puppet is moved closer to the light source. 		<p>Enquiry Skills opportunities</p> <ul style="list-style-type: none"> • I can compare • I can spot patterns • I can observe what happens over time • I can carry out a fair test and control variables. 			
<p>Related scientists</p> <p>Hasan Ibn al-Haytham (- sometimes known as Alhazen) (Physicist & Mathematician who developed a theory that light travels in a straight line, and proved it by carrying out the first scientific experiment) <i>Percy Shaw (Inventor of the cat's eye)</i></p>		<p>Common Misconceptions</p>			
<p>Yr 3 Explorify links</p>	<p>Observing changes over time</p>	<p>Noticing patterns</p>	<p>Grouping and classifying</p>	<p>Comparative or fair tests</p>	<p>Using secondary sources</p>
<p>Light</p>	<p>Exploding lights</p>	<p>Shadow shapes</p>	<p>Sources of light</p>	<p>Lightproof your secret den</p>	<p>What if we didn't have mirrors?</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. <ul style="list-style-type: none"> • 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>Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.</p>	
<p>By the end of this unit, children should know: (substantive/key knowledge)</p>	<p>By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:</p>
<ul style="list-style-type: none"> • Know that pollination happens when an insect carries pollen from the male part of the plant (stamen) to the female part (pistil). • Know the four methods of seed dispersal - • Know detailed parts of a plant: Filament, style, pistil, sepal, stem, ovary, stamen, petal, anther • Know that photosynthesis uses sunlight to make food for the plant. 	<ul style="list-style-type: none"> • Can explain observations made during investigations • Can look at the features of seeds to decide on their method of dispersal • Can draw and label a diagram of their created flowering plant to show its parts, their role and the method of pollination and seed dispersal
<p>Sticky Knowledge</p>	<p>Vocabulary</p>
<ul style="list-style-type: none"> • Can explain the function of the parts of a flowering plant • Can describe the life cycle of flowering plants, including pollination, seed formation, seed dispersal, and germination • Can explain what a flower needs for life and growth <p>Can explain how water is transported within plants</p>	<p>Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal- wind dispersal, animal dispersal, water dispersal, pollen, roots, stem, trunk, leaves, absorb, nutrients, reproduce, germination, stamen, style.</p>
<p>Previous learning</p>	<p>Future learning</p>
<ul style="list-style-type: none"> • Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants) • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants) 	<ul style="list-style-type: none"> • Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats) • Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. (KS3)
<p>Working Scientifically opportunities</p>	<p>Enquiry Skills opportunities</p>
<ul style="list-style-type: none"> • I can record my findings using labelled scientific diagrams. • I can plan a comparative test 	<ul style="list-style-type: none"> • I can identify the parts of the plant. • I can carry out a comparative test.



<ul style="list-style-type: none"> • I can interpret my findings using scientific knowledge. • I can explain in detail what pollination is. • I can evaluate my seed spinner. • I can look carefully at seeds 		<ul style="list-style-type: none"> • I can make observations over time. • I can use research and my own scientific knowledge to explain the process. • I can look for patterns. • I can identify and classify different seeds. 			
Related scientists		Common Misconceptions			
<p>Jan Ingenhousz (<i>Doctor & Scientist who discovered the process of photosynthesis</i>)</p> <p>Charles Henry Turner (<i>Zoologist who made ground-breaking discoveries about insect behaviour</i>)</p> <p>Jagadish Chandra Bose (<i>Biophysicist who measured plant response to different stimuli</i>)</p> <p>Dr Kelsey Byers (<i>Biologist who studies flower smells and how they attract insects</i>)</p>					
Yrs 3 and 4 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
Plants	Venus flytrap What a fun guy Furry fruits	Making records Sensitive plant	Friends of flowers Wet, and not so wet, leaves	How can you tell if something is a plant?	What if we did not plant trees? What if plants could talk?

Year 4: Living Things and their Habitats (Autumn 1)	
<ul style="list-style-type: none"> • <i>Recognise that living things can be grouped in a variety of ways.</i> • <i>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</i> • <i>Recognise that environments can change and that this can sometimes pose dangers to living things.</i> 	
Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) <i>Possible evidence:</i>



<ul style="list-style-type: none"> • Know that animals and plants can be put into different groups this is called classification. • Know the features of living things • Know that animals can be divided into warm and cold blooded • Know the names of these common UK Woodland animals • Know that humans can impact positively and negatively on the environment. • Know some examples of endangered species 	<ul style="list-style-type: none"> • <i>Can keep a careful record of living things found in different habitats throughout the year (diagrams, tally charts etc.)</i> • <i>Can use classification keys to identify unknown plants and animals</i> • <i>Can present their learning about changes to the environment in different ways e.g. campaign video, persuasive letter</i>
<p style="text-align: center;">Sticky Knowledge</p>	<p style="text-align: center;">Vocabulary</p>
<ul style="list-style-type: none"> • <i>Can name living things living in a range of habitats, giving the key features that helped them to identify them</i> • <i>Can give examples of how an environment may change both naturally and due to human impact</i> • <i>Can use classification keys to help group living things</i> 	<ul style="list-style-type: none"> • Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate, fish, amphibian, reptile, bird, mammal, vertebrate, invertebrate, shelter, food, protection, endangered
<p style="text-align: center;">Previous learning</p>	<p style="text-align: center;">Future learning</p>
<ul style="list-style-type: none"> • <i>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants)</i> • <i>Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)</i> • <i>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans)</i> • <i>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans)</i> • <i>Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)</i> 	<ul style="list-style-type: none"> • <i>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats)</i> • <i>Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)</i> • <i>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. (Y6 – Living things and their habitats)</i> • <i>Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)</i>
<p style="text-align: center;">Working Scientifically opportunities</p>	<p style="text-align: center;">Enquiry Skills opportunities</p>
<ul style="list-style-type: none"> • I can observe the features of living things. • I can identify similarities and differences in human characteristics. 	<ul style="list-style-type: none"> • I can identify different animals and classify them into different groups. • I can identify and classify based on human characteristics.



<ul style="list-style-type: none"> • I can gather, record and classify data. • I can ask relevant questions. • I can use evidence to answer questions. • I can record my findings from investigations using scientific language. 		<ul style="list-style-type: none"> • I can identify patterns by finding and identifying mini beast habitats. • I can identify and classify living things. • I can use research about endangered animals to show how environments can change. • I can research the effects of changing environments on animals. 			
Related scientists		Common Misconceptions			
<p>Jacques Cousteau (<i>Oceanographer and co-inventor of the aqualung</i>)</p> <p>Rachel Carson (<i>Aquatic Biologist who wrote about environmental pollution</i>)</p> <p>Wangari Maathai (<i>Biologist & Environmental Activist awarded the 2004 Nobel Peace Prize for her contribution to sustainable development</i>)</p> <p>Kelsey Archer Barnhill (<i>Deep Sea Ecologist who sends robots to the seafloor to collect samples of different animals to study</i>)</p> <p>Liz Bonnin (<i>TV Presenter & Wildlife Conservationist</i>)</p>					
Yrs 3 and 4 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
Living things and their habitats (biodiversity and interdependence)	Barnacle dive Family meal	Friends of flowers	High rise inhabitants Make a mark	Make a challenge-proof creature	What if we did not plant trees?

Year 4: Electricity (Autumn 2)	
<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. <ul style="list-style-type: none"> • 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. 	
<p>Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets.</p>	



By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) <i>Possible evidence:</i>
<ul style="list-style-type: none"> • Know that electricity is dangerous, and know how to be safe using it. • Know that electricity can produce light, sound, movement and heat • Know how electricity travels through a circuit, and the various components that create a circuit • Know the correct symbols to use when drawing circuits • Identify the hazards that might be faced in the home. • Know how to prevent these hazards and know not to touch anything they feel is unsafe. • Know how to create simple circuits using a battery, a bulb and a switch. • Know that Thomas Edison is known as one of the greatest inventors in history and invented the light bulb 	<ul style="list-style-type: none"> • <i>Can communicate structures of circuits using drawings which show how the components are connected</i> • <i>Use classification evidence to identify that metals are good conductors and non-metals are insulators</i> • <i>Can incorporate a switch into a circuit to turn it on and off</i> • <i>Can connect a range of different switches identifying the parts that are insulators and conductors</i> • <i>Can give reasons for choice of materials for making different parts of a switch</i> • <i>Can describe how their switch works</i>
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • <i>Can name the components in a circuit</i> • <i>Can make electric circuits</i> • <i>Can control a circuit using a switch</i> • <i>Can name some metals that are conductors</i> • <i>Can name materials that are insulators</i> 	<ul style="list-style-type: none"> • electricity, circuit, bulb, mains, plug, buzzer, wire, motor, cell, battery, conductor, insulator, symbol, electrons, current, voltage
Previous learning	Future learning
<ul style="list-style-type: none"> • <i>Explore how things work. (Nursery - Electricity)</i> 	<ul style="list-style-type: none"> • <i>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. (Y6 - Electricity)</i> • <i>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. (Y6 - Electricity)</i> • <i>Use recognised symbols when representing a simple circuit in a diagram. (Y6 - Electricity)</i>
Working Scientifically opportunities	Enquiry Skills opportunities



<ul style="list-style-type: none"> • I can record my work using labelled drawings • I can make predictions using scientific language • I can interpret my results using my scientific knowledge • I can identify the properties of different materials. • I can pose scientific questions • I can record how electricity can help us 		<ul style="list-style-type: none"> • Identify electrical components and classify appliances. • I can identify patterns in my observations. • I can conduct a comparative test. • I can identify the properties of materials. • I can find out about different scientists and energy sources. • I know how electricity has developed over time. 	
Related scientists		Common Misconceptions	
<p>Thomas Edison (<i>Inventor of the lightbulb and power grid</i>)</p> <p>Joseph Swan (<i>Physicist & Chemist who developed a primitive electric light 20 years before Thomas Edison</i>)</p> <p>Lewis Howard Latimer (<i>Electronic Engineer who improved the design of Edison's light bulb and brought street lighting to the world</i>)</p> <p>Ronit Kanwar (<i>Businessman who set up company to provide affordable, sustainable solar-powered lights for poor in rural India</i>)</p> <p>William Kamkwamba (<i>Inventor who used wind turbines to bring electricity to his village in Malawi</i>)</p> <p>Zubera Iqbal (<i>Chemist who explores sustainable ways to recycle electric vehicle batteries</i>)</p>		<ul style="list-style-type: none"> • electricity flows to bulbs, not through them • electricity flows out of both ends of a battery • electricity works by simply coming out of one end of a battery into the component. 	
Yr 4 Explorify links	Noticing patterns	Grouping and classifying	
	https://explorify.uk/en/activities/have-you-ever/tried-to-turn-something-on-when-it-wasnt-turned-on-at-the-plug	https://explorify.uk/en/activities/odd-one-out/electrical-appliances	

Year 4: Animals incl. Humans- Digestive system (Spring 1)
<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.
Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.



By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) <i>Possible evidence:</i>
<ul style="list-style-type: none"> • Know that digestion is the breaking down of food mechanically in the mouth before chemically in the stomach. • Know that the mouth, tongue, teeth, oesophagus, stomach, small and large intestine make up the human digestive system. • Know that there are different teeth for different purposes. • Know that a food chain is a series of living things which are linked to each other because each thing feeds on the one next to it in the series. • Know that plants are producers and all animals are consumers, • Know that prey are animals that are consumed by other animals and predators are animals that consume other animals. 	<ul style="list-style-type: none"> • <i>Can use diagrams or a model to describe the journey of food through the body explaining what happens in each part</i> • <i>Can record the teeth in their mouth (make a dental record)</i> • <i>Can explain the role of the different types of teeth</i> • <i>Can explain how the teeth in animal skulls show they are carnivores, herbivores or omnivores</i> • <i>Can create food chains based on research</i>
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • <i>Can sequence the main parts of the digestive system</i> • <i>Can draw the main parts of the digestive system onto a human outline</i> • <i>Can describe what happens in each part of the digestive system</i> • <i>Can point to the three different types of teeth in their mouth and talk about their shape and what they are used for</i> • <i>Can name producers, predators, and prey within a habitat</i> • <i>Can construct food chains</i> 	<p>digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, incisor, canine, herbivore, omnivore.</p>
Previous learning	Future learning
<ul style="list-style-type: none"> • <i>Identify and name a variety of common animals that are carnivores, herbivores, and omnivores. (Y1 - Animals, including humans)</i> • <i>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans)</i> • <i>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans)</i> • <i>Identify that animals, including humans, need the right types and amount</i> 	<ul style="list-style-type: none"> • <i>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. (Y6 - Animals, including humans)</i> • <i>Recognise the impact of diet, exercise, drugs and lifestyle on the way their body's function. (Y6 - Animals, including humans)</i> • <i>Describe the ways in which nutrients and water are transported within animals, including humans. (Y6 - Animals, including humans)</i>



<p><i>of nutrition, and that they cannot make their own food; they get nutrition from what they eat. (Y3 - Animals, including humans)</i></p>					
<p>Working Scientifically opportunities</p> <ul style="list-style-type: none"> • I can observe the similarities and differences in human/animal teeth. • I can interpret and present learning of digestive system through models. • I can set up my own test to see the effects of different liquids on tooth decay. • I can make predictions based on knowledge of liquids to decay teeth. • I can record my results in a table and bar graph. • I can ask questions to find out what animals eat. • I can evaluate learning 			<p>Enquiry Skills opportunities</p> <ul style="list-style-type: none"> • Identify the organs of the digestive system and use model to explain thinking. • Identify the different teeth and know their function. • Identify and compare similarities and differences in human and animal teeth. • Set up a comparative test to show effects of tooth decay. • Observe tooth decay over time. • Research animal food chains to find out what animals eat. • Identify foods animals eat to classify. • Identify patterns 		
<p>Related scientists</p> <p><i>William Beaumont (Surgeon who first observed and studied human digestion as it occurs in the stomach)</i></p> <p><i>Washington & Lucius Sheffield (Dentists who invented toothpaste in a tube)</i></p> <p><i>Paul Sharpe (Bioengineer who studies how to regrow teeth if they become damaged)</i></p>			<p>Common Misconceptions</p> <ul style="list-style-type: none"> • arrows in food chains mean 'eats' • the death of one of the parts of a food chain or web has no, or limited, consequences on the rest of the chain • there is always plenty of food for wild animals • your stomach is where your belly button is • food is digested only in the stomach • when you have a meal, your food goes down one tube and your drink down another • the food you eat becomes "poo" and the drink becomes "wee". 		
<p>Yrs 3 and 4 Explorify links</p> <p>Animals including humans</p>	<p>Observing changes over time</p> <p>Thirsty work The damselfly's day</p>	<p>Noticing patterns</p> <p>Odd octopus</p>	<p>Grouping and classifying</p> <p>Topsy turvy Weird walkers Spot the difference</p>	<p>Comparative or fair tests</p> <p>Which breakfast is best?</p>	<p>Using secondary sources</p> <p>What if we ate insects?</p>



Year 4: States of Matter (Spring 2 & Summer 1 extended unit)	
<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>Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets.</p> <p>Chemistry: Chemistry is like a recipe book for everything in the world, showing us how different things mix together to make new things.</p>	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) <i>Possible evidence:</i>
<ul style="list-style-type: none"> • Know that everything is made up of tiny particles. • Know there are three states: solid, liquid and gas. • In a solid state the vibrating particles form a regular pattern. This explains the fixed shape of a solid and why it can't be compressed or poured. • In a liquid the particles still touch their neighbours but they move around, sliding over each other. This is why you can pour, but not compress (squash), a liquid. • In the gas state, widely-spaced particles move around randomly. • Know the term for each part of the water cycle: evaporation, condensation, precipitation, runoff 	<ul style="list-style-type: none"> • Can give reasons to justify why something is a solid liquid or gas • Can give examples of things that melt/freeze and how their melting points vary • From their observations, can give the melting points of some materials • Using their data, can explain what affects how quickly a solid melts • Can measure temperatures using a thermometer • Can explain why there is condensation on the inside the hot water cup but on the outside of the icy water cup • From their data, can explain how to speed up or slow down evaporation • Can present their learning about the water cycle in a range of ways e.g. diagrams, explanation text, story of a water droplet
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • Can create a concept map, including arrows linking the key vocabulary • Can name properties of solids, liquids and gases • Can give everyday examples of melting and freezing • Can give everyday examples of evaporation and condensation • Can describe the water cycle 	<ul style="list-style-type: none"> • Liquid, Solid, Gas, Particles, Matter, Temperature, Thermometer, Melting, Freezing, Melting point, Freezing point, Evaporation, Water cycle, Condensation, Heating, Cooling
Previous learning	Future learning
<ul style="list-style-type: none"> • Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) 	<ul style="list-style-type: none"> • Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity



<ul style="list-style-type: none"> • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) • Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials) • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials) • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials) 	<p>(electrical and thermal), and response to magnets. (Y5 - Properties and changes of materials)</p> <ul style="list-style-type: none"> • Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. (Y5 - Properties and changes of materials) • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. (Y5 - Properties and changes of materials) • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (Y5 - Properties and changes of materials) • Demonstrate that dissolving, mixing and changes of state are reversible changes. (Y5 - Properties and changes of materials) • 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. (Y5 - Properties and changes of materials)
<p>Working Scientifically opportunities</p>	<p>Enquiry Skills opportunities</p>
<ul style="list-style-type: none"> • I can make careful observations and identify similarities and differences. • I can make predictions using straightforward evidence and observations. • I can use a thermometer to take accurate measurements (observe closely to nearest degree) • I can interpret what I have observed using my own scientific knowledge. • I can set up tests to answer questions. • I can record using diagrams what I know about the water cycle 	<ul style="list-style-type: none"> • I can compare and group materials depending on their properties • I can look for patterns • I can construct a fair test • I can observe over time • I can carry out a fair test and identify the change and measure factor • I can observe the water cycle over time
<p>Related scientists</p>	<p>Common Misconceptions</p>
<p><u>Joseph Priestley</u> (Clergyman who discovered oxygen at about the same time as Carl Wilhelm Scheele)</p> <p><u>Carl Wilhelm Scheele</u> (Chemist who discovered oxygen at about the same time as Joseph Priestley)</p>	



<p>Daniel Fahrenheit (<i>Physicist who invented the Fahrenheit temperature scale and the thermometer</i>)</p> <p>Anders Celsius (<i>Astronomer who invented the degrees Celsius temperature scale</i>)</p> <p>John Boyd Dunlop (<i>Inventor of the pneumatic tyre</i>)</p>					
<p>Yr 4 Explorify links States of matter/materials</p>	<p>Observing changes over time</p>	<p>Noticing patterns</p>	<p>Grouping and classifying</p>	<p>Comparative or fair tests</p>	<p>Using secondary sources</p>
	<p>Top of the pops</p>	<p>Multiple liquid densities</p>	<p>Nifty naturals Totally organic Branching out</p>	<p>Water carriers Ice lollies How do smells travel?</p>	<p>What if water couldn't freeze? What if the sea was gloopy (like ketchup)?</p>

Year 4: Sound (Summer 2)	
<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>Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets.</p>	
<p>By the end of this unit, children should know: (substantive/key knowledge)</p>	<p>By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge)</p> <p><i>Possible evidence:</i></p>
<ul style="list-style-type: none"> Know sounds are made when something vibrates. Know that sound travels in longitudinal waves as each particle pushes the particles next to it. Know that sound waves carry energy from one place to another Know that sound cannot travel through space as there is no air. This is called a vacuum. Know the structure/ anatomy of the human ear. Know that pitch is how high or low a sound is. 	<ul style="list-style-type: none"> Can explain what happens when you strike a drum or pluck a string and use a diagram to show how sounds travel from an object to the ear Can demonstrate how to increase or decrease pitch and volume using musical instruments or other objects Can use data to identify patterns in pitch and volume Can explain how loudness can be reduced by moving further from the sound source or by using a sound insulating medium



<ul style="list-style-type: none"> • Know that the volume of a sound is how loud or quiet a sound is. 	
<p>Sticky Knowledge</p>	<p>Vocabulary</p>
<ul style="list-style-type: none"> • <i>Can name sound sources and state that sounds are produced by the vibration of the object</i> • <i>Can state that sounds travel through different mediums such as air, water, metal</i> • <i>Can give examples to demonstrate how the pitch of a sound are linked to the features of the object that produced it</i> • <i>Can give examples of how to change the volume of a sound e.g. increase the size of vibrations by hitting or blowing harder</i> • <i>Can give examples to demonstrate that sounds get fainter as the distance from the sound source increases</i> 	<ul style="list-style-type: none"> • Sound, source, vibrate, vibration, travel, pitch, volume, faint, loud, insulation.
<p>Previous learning</p>	<p>Future learning</p>
<ul style="list-style-type: none"> • <i>Explore how things work. (Nursery – Sound)</i> • <i>Describe what they see, hear and feel whilst outside. (Reception – Sound)</i> • <i>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)</i> 	<ul style="list-style-type: none"> • <i>Waves on water as undulations which travel through water with transverse motion; these waves can be reflected and add or cancel – superposition. (KS3)</i> • <i>Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound. (KS3)</i> • <i>Sound needs a medium to travel, the speed of sound in air, in water, in solids. (KS3)</i> • <i>Sound produced by vibrations of objects, in loudspeakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal. (KS3)</i> • <i>Auditory range of humans and animals. (KS3)</i> • <i>Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound. (KS3)</i> • <i>Waves transferring information for conversion to electrical signals by microphone. (KS3)</i>
<p>Working Scientifically opportunities</p>	<p>Enquiry Skills opportunities</p>
<ul style="list-style-type: none"> • I can make careful observations and identify similarities and differences. 	<ul style="list-style-type: none"> • I can compare and group materials depending in their properties.



<ul style="list-style-type: none"> • I can set up tests to create the best string phone • I can record my results in a table to spot patterns. • I can record my results in a table and a line graph. • I can observe how sounds are created and feel the vibrations causing the sound. 		<ul style="list-style-type: none"> • I can plan a fair test. • I can spot patterns in my results. • I can spot patterns in my results to make conclusions. • I can carry out a pattern seeking enquiry. 			
Related scientists		Common Misconceptions			
<p>Aristotle (Philosopher who developed the concept that sound travels through air due to the movement of air particles)</p> <p>Isaac Newton (Mathematician & Physicist who measured the speed of sound)</p>					
Yr 4 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
Sound	Sound of silence	Rice and rhythm	What's that sound?	Protect your ears	Lyre liar

Year 5: Forces (Autumn 1)	
<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. <ul style="list-style-type: none"> • 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. 	
Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets.	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) <i>Possible evidence:</i>
<ul style="list-style-type: none"> • Know that the force that pulls things to the ground on Earth (and other planets) is called gravity. • Understand the difference between mass and weight. Know that mass is constant • Know that Sir Isaac Newton is said to have 'discovered' the concept of gravity 	<ul style="list-style-type: none"> • Can explain the results of their investigations in terms of the force, showing a good understanding that as the object tries to move through the water or air or across the surface the particles in the water, air or on the surface slow it down • Can demonstrate clearly the effects of using levers, pulleys and gears



<ul style="list-style-type: none"> • Know that friction occurs when objects move through water or air. Air resistance is a type of friction between air and another material • If you go swimming, there is friction between your skin and the water particles. This is known as water resistance. • Know that levers, pulleys and gears are mechanisms that allow a small force to have a greater effect 	
<p>Sticky Knowledge</p>	<p>Vocabulary</p>
<ul style="list-style-type: none"> • <i>Can demonstrate the effect of gravity acting on an unsupported object</i> • <i>Can give examples of friction, water resistance and air resistance</i> • <i>Can give examples of when it is beneficial to have high or low friction, water resistance and air resistance</i> • <i>Can demonstrate how pulleys, levers and gears work</i> 	<ul style="list-style-type: none"> • Force, Gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears, Newton, up thrust, opposing, streamline, brake, cog, weight, mass.
<p>Previous learning</p>	<p>Future learning</p>
<ul style="list-style-type: none"> • <i>Compare how things move on different surfaces. (Y3 - Forces and magnets)</i> • <i>Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets)</i> • <i>Observe how magnets attract or repel each other and attract some materials and not others. (Y3 - Forces and magnets)</i> • <i>Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials. (Y3 - Forces and magnets)</i> • <i>Describe magnets as having two poles. (Y3 - Forces and magnets)</i> • <i>Predict whether two magnets will attract or repel each other, depending on which poles are facing. (Y3 - Forces and magnets)</i> 	<ul style="list-style-type: none"> • <i>Forces as pushes or pulls, arising from the interaction between two objects. (KS3)</i> • <i>Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces. (KS3)</i> • <i>Moment as the turning effect of a force. (KS3)</i> • <i>Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water. (KS3)</i> • <i>Forces measured in Newtons, measurements of stretch or compression as force is changed. (KS3)</i>
<p>Working Scientifically opportunities</p>	<p>Enquiry Skills opportunities</p>
<ul style="list-style-type: none"> • I can observe different forces and measure the force using scientific equipment. • I can set up a test which answers a scientific enquiry 	<ul style="list-style-type: none"> • I can research the effects of gravity and research Sir Isaac Newton's theories. • I can observe over time



<ul style="list-style-type: none"> • I can interpret and communicate results, from my data using scientific vocabulary. • I can plan different types of enquiries to answer questions. • I can take measurements using a range of scientific equipment with increasing accuracy and precision taking repeat readings. • I can record my results in a table. 		<ul style="list-style-type: none"> • I can conduct a fair test to explore the effects of air resistance on a falling object. • I can conduct a comparative test to investigate water resistance. • I can look for patterns in my results. 			
Related scientists		Common Misconceptions			
<p>Sir Isaac Newton Archimedes (Mathematician who developed theories about how levers and pulleys can lift and move heavy objects) Galileo Galilei (Astronomer, Mathematician & Physicist who was the first person to use the scientific method to test theories about gravity and the Solar System) George Cayley (Aeronautical Engineer who designed the first successful glider to carry a human being) Brahmagupta (Mathematician & Astronomer who was the first scientist to talk about gravity)</p>		<ul style="list-style-type: none"> • the heavier the object, the faster it falls because it has more gravity acting on it • forces always act in pairs which are equal and opposite • smooth surfaces have no friction • a moving object has a force which is pushing it forwards and it stops when the pushing force wears out • a non-moving object has no force acting on it • heavy objects sink and light objects float 			
Yr 5 Explorify links Forces	Observing changes over time 3,2,1, lift off	Noticing patterns Blocks Spinning spiral	Grouping and classifying Shoot the breeze Take your turn	Comparative or fair tests Take a whisk Paper planes	Using secondary sources What if there was no gravity? What if brakes were automatic?

Year 5: Materials (Autumn 2)	
<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. <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • Demonstrate that dissolving, mixing and changes of state are reversible changes. 	



<ul style="list-style-type: none"> • 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>Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets.</p> <p>Chemistry: Chemistry is like a recipe book for everything in the world, showing us how different things mix together to make new things.</p>	
<p>By the end of this unit, children should know: (substantive/key knowledge)</p>	<p>By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge)</p> <p><i>Possible evidence:</i></p>
<ul style="list-style-type: none"> • Know that hardness can be measured by observing if one material can scratch another. • Know that solubility is the ability of a substance to dissolve • Know that dissolving is when a solid material mixes with a liquid and is no longer visible. • Know that a thermal conductor is a material that allows heat to be transferred easily • Know that an electrical conductor allows electricity to flow through it. • Know that an electrical insulator does not. • Know that reversible changes are changes that are not permanent. 	<ul style="list-style-type: none"> • Can create a chart or table grouping/comparing everyday materials by different properties • Can use test evidence gathered about different properties to suggest an appropriate material for a particular purpose • Can group solids based on their observations when mixing them with water • Can give reasons for choice of equipment and methods to separate a given solution or mixture such as salt or sand in water • Can explain the results from their investigations
<p>Sticky Knowledge</p>	<p>Vocabulary</p>
<ul style="list-style-type: none"> • Can use understanding of properties to explain everyday uses of materials, for example, how bricks, wood, glass, and metals are used in buildings • Can explain what dissolving means, giving examples • Can name equipment used for filtering and sieving • Can use knowledge of liquids, gases and solids to suggest how materials can be recovered from solutions or mixtures by evaporation, filtering or sieving • Can describe some simple reversible and non-reversible changes to materials, giving examples 	<ul style="list-style-type: none"> • Key Vocabulary: solid, liquid, gas, transparent, soluble, insoluble, conductor, filtering, evaporation, condensation, reversible
<p>Previous learning</p>	<p>Future learning</p>



<ul style="list-style-type: none"> • <i>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)</i> • <i>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)</i> • <i>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. (Y3 - Forces and magnets)</i> • <i>Compare and group materials together, according to whether they are solids, liquids or gases. (Y4 - States of matter)</i> • <i>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). (Y4 - States of matter)</i> • <i>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. (Y4 – States of matter)</i> 	<ul style="list-style-type: none"> • <i>Chemical reactions as the rearrangement of atoms. (KS3)</i> • <i>Representing chemical reactions using formulae and using equations. (KS3)</i> • <i>Combustion, thermal decomposition, oxidation and displacement reactions. (KS3)</i> • <i>Defining acids and alkalis in terms of neutralisation reactions. (KS3)</i> • <i>The pH scale for measuring acidity/alkalinity; and indicators. (KS3)</i>
<p>Working Scientifically opportunities</p>	<p>Enquiry Skills opportunities</p>
<ul style="list-style-type: none"> • Evaluate my test. • I can make predictions about which materials are soluble and insoluble. • I can use scientific language and illustrations to discuss, communicate and justify ideas. • I can make careful observations when heating solutions. • I can plan my own test based on how materials react with one another. • I can record results in a table 	<ul style="list-style-type: none"> • Identify different materials and classify based on its properties. • I can identify the properties of different materials based on whether it will dissolve. • I can make observations over time • I can compare how reversible and Irreversible materials act when heated and cooled. • I notice patterns in my results. • I learn about famous scientists and what major discoveries they have made.
<p>Related scientists</p>	<p>Common Misconceptions</p>



Spencer Silver & Arthur Fry (<i>Chemical Engineer & Chemist respectively who invented the post-it note</i>) Ruth Benerito (<i>Chemist who developed wrinkle-free cotton fabric</i>) Andre Geim & Konstantin Novoselov (<i>Physicists who discovered graphene</i>) Jamie Garcia (<i>Chemist who discovered a fully recyclable plastic</i>) Raquel Prado (<i>Chemist who develops a sustainable fabric that looks like leather but comes from pineapple leaves that would otherwise be burnt</i>)					
Yrs 5 and 6 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
Properties and changes of materials	Brilliantly bouncy egg Shaking sensation	Melting ice cubes	Electrifying metals Interesting insulators	How do you protect an egg? How strong is our hair?	What if an astronaut gets thirsty?

Year 5: Earth and Space (Spring 1 & Spring 2 extended unit)	
<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. 	
<p>Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets.</p> <p>Chemistry: Chemistry is like a recipe book for everything in the world, showing us how different things mix together to make new things.</p>	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) <i>Possible evidence:</i>
<ul style="list-style-type: none"> • Know that the Earth, sun and moon are approximately spherical bodies in space. • Know that the sun is a star and the moon is a satellite, not planets. • Know that the Earth rotates once every 24 hours. • Know that this creates day and night • Know that the sun is the ball of gas in the sky that the Earth goes round, and that gives us heat and light. 	<ul style="list-style-type: none"> • Can use the model to explain how the Earth moves in relation to the Sun and the Moon moves in relation to the Earth • Can demonstrate and explain verbally how day and night occur • Can explain evidence gathered about the position of shadows in term of the movement of the Earth and show this using a model • Can explain how a sundial works • Can explain verbally, using a model, why we have time zones • Can describe the arguments and evidence used by scientists in the past



<ul style="list-style-type: none"> • Know that it is not safe to look directly at the Sun, even when wearing dark glasses • Know that the Earth spins on an imagined axis, • Know that the moon is not a light source it reflects the light from the sun. • Know the names of the planets in our solar system in order from the sun - Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, • Know that Neil Armstrong was the first person on the moon in 1969 	
<p>Sticky Knowledge</p>	<p>Vocabulary</p>
<ul style="list-style-type: none"> • <i>Can show, using diagrams, the movement of the Earth and Moon</i> • <i>Can explain the movement of the Earth and Moon</i> • <i>Can show using diagrams the rotation of the Earth and how this causes day and night</i> • <i>Can explain what causes day and night</i> 	<ul style="list-style-type: none"> • Earth, sun, moon, Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune, Pluto (dwarf planet), spherical, solar system, rotates, star, orbit, planets, axis, night, day, season, galaxy, meteorite, celestial.
<p>Previous learning</p> <ul style="list-style-type: none"> • <i>Explore the natural world around them. (Reception – Earth and space)</i> • <i>Describe what they see, hear and feel whilst outside. (Reception – Earth and space)</i> • <i>Observe changes across the four seasons. (Y1 - Seasonal changes)</i> • <i>Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes)</i> 	<p>Future learning</p> <ul style="list-style-type: none"> • <i>Gravity force, weight = mass x gravitational field strength (g), on Earth g=10 N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only). (KS3)</i> • <i>Our Sun as a star, other stars in our galaxy, other galaxies. (KS3)</i> • <i>The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. (KS3)</i> • <i>The light year as a unit of astronomical distance. (KS3)</i>
<p>Working Scientifically opportunities</p> <ul style="list-style-type: none"> • I can raise questions and suggest reasons for similarities and differences. • I can use measurement to represent planets in a model • I can record my work using scientific diagrams and labels. 	<p>Enquiry Skills opportunities</p> <ul style="list-style-type: none"> • Identify and classify planets • Observe changes over time • Use research and secondary sources to find out about the moon. • Look for patterns in day light hours.



<ul style="list-style-type: none"> • I can use a model to discuss, communicate and justify scientific ideas using scientific vocabulary. • I can present results in a variety of ways to answer a question. • I can plan own test and control variables. 		<ul style="list-style-type: none"> • Conduct a fair test where variables are controlled. 	
<p>Related scientists</p> <p>Claudius Ptolemaeus(Ptolemy) (Astronomer who developed the theory that the Earth was at the centre of the Solar System around which the Sun and other planets orbited)</p> <p>Nicolaus Copernicus (Astronomer who developed the theory that the Sun was at the centre of the Solar System around which the planets orbited)</p> <p>Galileo Galilei (Astronomer, Mathematician & Physicist who made the first telescope and discovered Neptune and the rings of Saturn)</p> <p>Johannes Kepler (Mathematician, Astronomer and Astrologer who developed the theory that the planets moved on oval paths around the Sun)</p> <p>Stephen Hawking (Physicist & Cosmologist who developed the theory that the Big Bang may have been caused by a black hole in reverse)</p> <p>Neil Armstrong (Astronaut who was the first human to walk on the Moon)</p> <p>Margaret Hamilton (Computer Scientist who was responsible for the software that allowed astronauts Neil Armstrong and Buzz Aldrin to land on the Moon)</p> <p>Caroline Herschel (Astronomer who was the first woman to discover a comet)</p> <p>Valentina Tereshkova (Astronaut and first woman in space)</p> <p>Mae Jemison (Astronaut and first Black woman in space)</p> <p>Dr Claudia Alexander (Physicist who was the Project Manager on NASA's Galileo mission to Jupiter)</p> <p>Maggie Aderin-Pocock (Space Scientist & TV Presenter)</p> <p>Helen Sharman (Astronaut who was the first British citizen to go into space)</p> <p>Tim Peake (Astronaut who was the first British person to walk in space)</p>		<p>Common Misconceptions</p> <ul style="list-style-type: none"> • the Earth is flat • the Sun is a planet • the Sun rotates around the Earth • the Sun moves across the sky during the day • the Sun rises in the morning and sets in the evening • the Moon appears only at night • night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth. 	
<p>Yr 5 Explorify links</p>	<p>Observing changes over time</p>	<p>Noticing patterns</p>	<p>Using secondary sources</p>
	<p>https://explorify.uk/en/activities/have-you-ever/looked-at-the-moon-and-noticed-how-it-appears-to-be-different-shapes-at-different-times</p>	<p>https://explorify.uk/en/activities/odd-one-out/maps-of-the-solar-system</p>	<p>https://explorify.uk/en/activities/what-if/there-was-no-gravity</p>



Year 5: Living Things and their Habitats (Summer 1)	
<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>Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.</p>	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:
<ul style="list-style-type: none"> • Know all the acronym MRS NERG and give explanation of each • Know that a life cycle is the different stages of life for a living thing • Know that sexual reproduction in plants happens in a cycle-like pattern. • Know that scientist Jane Goodall is an English conservationist whose ground-breaking research on chimpanzees has shaped our understanding of what it is to be human. • Know that scientist David Attenborough is an English broadcaster and naturalist; best known for his educational tv programmes. 	<ul style="list-style-type: none"> • Can present their understanding of the life cycle of a range of animals in different ways e.g. drama, pictorially, chronological reports, creating a game • Can identify patterns in life cycles • Can compare two or more animal life cycles they have studied • Can explain how a range of plants reproduce asexually
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • Can draw the life cycle of a range of animals identifying similarities and differences between the life cycles • Can explain the difference between sexual and asexual reproduction and give examples of how plants reproduce in both ways 	<ul style="list-style-type: none"> • life cycle, live, young, fertilises, egg, runners, reproduce, sperm, metamorphosis, gestation, cuttings, plantlets, bulb, sexual/asexual reproduction
Previous learning	Future learning
<ul style="list-style-type: none"> • Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans) • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants) 	<ul style="list-style-type: none"> • Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta. (KS3) • Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. (KS3)



Working Scientifically opportunities		Enquiry Skills opportunities			
<ul style="list-style-type: none"> • I can use oral and written forms to report conclusions • I can present data in a variety of different ways to help answer my questions • I can ask relevant questions and find ways to answer them. • I can make accurate and relevant predictions • I can suggest next steps based on the weakest aspects of my enquiry • I can record my results using a bar chart and can explain the results 		<ul style="list-style-type: none"> • I can identify patterns that might be found in the natural environment • I can sort and classify different life cycles to identify similarities and differences. • I can independently use secondary sources to research the work of naturalists and animal behaviourists. • I can report and present my findings from research • I can present my findings including explanations in oral and written forms. • I can look for patterns when considering gestation periods of animals 			
Related scientists		Common Misconceptions			
David Attenborough Jane Godall					
Yrs 5 and 6 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
Living things and their habitats (biodiversity and interdependence)	Tangling brambles Sudden downpour	Super seeds	Puddle pals The drinks menu	Seeds	What if there were no deserts?

Year 5: Animals incl. Humans (Summer 2)	
<ul style="list-style-type: none"> • Describe the changes as humans develop to old age. 	
<p>Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.</p>	
<p>By the end of this unit, children should know: (substantive/key knowledge)</p>	<p>By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:</p>



<ul style="list-style-type: none"> • Know that all humans grow and develop from the time they are born until old age- lifecycle of a human • Know the terms foetus, baby, infant/toddler, child, teenager/adolescent, young adult, adult and elderly/pensioner, death and the periods with which they roughly refer. • Know that puberty is when changes occur in the body during adolescence. It is the end of the development of the body. • Know that an embryo develops into a foetus in the mother's womb and that over time the foetus develops typical human features including arms and legs. • Know examples of puberty changes in girls and boys • Know that we must look after our mental health. A healthy mind is as important as a healthy body. • We can look after our mental health by: Eating well, drinking water, doing activities we enjoy, sleeping well, having good friends, working towards our goals, talking to people we trust about how we feel. 	<ul style="list-style-type: none"> • <i>Can present information about the changes occurring during puberty as an information leaflet for other Y5 children or answers to 'problem page questions'</i>
<p>Sticky Knowledge</p>	<p>Vocabulary</p>
<ul style="list-style-type: none"> • <i>Can explain the changes that takes place in boys and girls during puberty</i> • <i>Can explain how a baby changes physically as it grows, and what it is able to do</i> 	<ul style="list-style-type: none"> • Adolescent, adult, asexual reproduction, sexual reproduction, fertilization, death, teenager, elderly, toddler, reproduction, foetus, growth, puberty, menstrual cycle, gestation.
<p>Previous learning</p>	<p>Future learning</p>
<ul style="list-style-type: none"> • <i>Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)</i> 	<ul style="list-style-type: none"> • <i>Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta. (KS3)</i>
<p>Working Scientifically opportunities</p>	<p>Enquiry Skills opportunities</p>
<ul style="list-style-type: none"> • I can make predictions on gestation periods of animals. 	<ul style="list-style-type: none"> • I can look for patterns in gestation periods. • I can notice changes over time.



<ul style="list-style-type: none"> • I can record data using a scatter graph. • I can make careful observations as we grow older. • I can record my learning using scientific diagrams and vocabulary. • I can interpret my findings to help others. • I can evaluate my learning 		<ul style="list-style-type: none"> • I can use research and my own subject knowledge to order stages of human development. • I can identify changes in the body. • I can use research and subject knowledge to help others. • I can use research and subject knowledge to help others. 	
Related scientists		Common Misconceptions	
Yr 5 Explorify links	Noticing patterns	Grouping and classifying	Using secondary sources
	https://explorify.uk/en/activities/odd-one-out/perfect-pinchers	https://explorify.uk/en/activities/odd-one-out/brilliant-brain-case	https://explorify.uk/en/activities/what-if-we-could-bring-back-woolly-mammoths

Year 6: Light (Autumn 1)	
<ul style="list-style-type: none"> • <i>Recognise that light appears to travel in straight lines.</i> • <i>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.</i> • <i>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.</i> • <i>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</i> 	
Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets.	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) <i>Possible evidence:</i>
<ul style="list-style-type: none"> • Know that light travels in straight lines from its source. Know that some light sources are natural and some are man-made • Know that light either travels in a straight line directly from the source or by reflecting off a surface into our eye. • Know that reflection is when light bounces off a surface, 	<ul style="list-style-type: none"> • <i>Can explain how evidence from enquiries shows that light travels in straight lines</i> • <i>Can predict and explain, with diagrams or models as appropriate, how the path of light rays can be directed by reflection to be seen, e.g. the reflection in car rear view mirrors or in a periscope</i> • <i>Can predict and explain, with diagrams or models as appropriate, how the shape of shadows can be varied</i>



Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • Can describe, with diagrams or models as appropriate, how light travels in straight lines either from sources or reflected from other objects into our eyes • Can describe, with diagrams or models as appropriate, how light travels in straight lines past translucent or opaque objects to form a shadow of the same shape 	<ul style="list-style-type: none"> • Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, refraction, medium, dense.
Previous learning	Future learning
<ul style="list-style-type: none"> • Recognise that they need light in order to see things and that dark is the absence of light. (Y3 - Light) • Notice that light is reflected from surfaces. (Y3 - Light) • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light) • Recognise that shadows are formed when the light from a light source is blocked by an opaque object. (Y3 - Light) • Find patterns in the way that the size of shadows change. (Y3 - Light) • 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. (Y5 - Properties and changes of materials) 	<ul style="list-style-type: none"> • The similarities and differences between light waves and waves in matter. (KS3) • Light waves travelling through a vacuum; speed of light. (KS3) • The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. (KS3) • Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye. (KS3) • Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras. (KS3) • Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection. (KS3)
Working Scientifically opportunities	Enquiry Skills opportunities
<ul style="list-style-type: none"> • I can use scientific diagrams, models and labels. • I can use labelled diagrams to support my explanation. • I can make careful observations about how the eye works. • I can draw diagrams to represent concepts with accuracy • I can make predictions based on scientific knowledge and use tests to gather evidence to support my predictions. 	<ul style="list-style-type: none"> • I can look for patterns in how light reflects from surfaces. • I can use subject knowledge and research to make a periscope • I can identify different parts of the eye and explain how each part works. • I can look for patterns in my observations. • I can use subject knowledge about refraction to make predictions. • I can look for patterns in how we see things.



<ul style="list-style-type: none"> I can evaluate, using scientific language, how my enquiry answers the question. 					
Related scientists			Common Misconceptions		
<p>Euclid (Mathematician who predicted that light travels in straight lines and we only see things that light falls on)</p> <p>Ibn Sahl (Mathematician who observed the paths of rays of light as they reflected off different mirrors)</p> <p>Colin Webb (Professor of Laser Physics)</p>			We see objects because light travels from our eyes to the object		
Yr 6 Explorify links	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
Light	Light and time	Find your focus	Now you see me...	See round the bend	What if there were two suns?

Year 6: Electricity (Autumn 2)	
<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. 	
Physics: Physics is the study of how everything in the universe moves and works, from tiny atoms to big planets.	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:
<ul style="list-style-type: none"> Know that the electrical energy can be converted into other types of energy such as light, heat, movement or sound. Know that renewable energy is useful energy that is collected from renewable resources Know some common electrical hazards Know that American scientist Benjamin Franklin carried out important experiments relating to electricity 	<ul style="list-style-type: none"> Can incorporate a switch into a circuit to turn it on and off Can change cells and components in a circuit to achieve a specific effect Can communicate structures of circuits using circuit diagrams with recognised symbols Can devise ways to measure brightness of bulbs, speed of motors, volume of a buzzer during a fair test Can predict results and answer questions by drawing on evidence gathered



<ul style="list-style-type: none"> • Know that electricity can flow through the components in a complete electrical circuit. • Know that when drawing circuit diagrams, rather than drawing detailed components, we use simple symbols to represent different components. 	
<p style="text-align: center;">Sticky Knowledge</p>	<p style="text-align: center;">Vocabulary</p>
<ul style="list-style-type: none"> • <i>Can make electric circuits and demonstrate how variation in the working of particular components, such as the brightness of bulbs, can be changed by increasing or decreasing the number of cells or using cells of different voltages</i> • <i>Can draw circuit diagrams of a range of simple series circuits using recognised symbols</i> 	<ul style="list-style-type: none"> • renewable, non-renewable, circuit, symbol, cell, battery, amps, voltage, resistance, electrons
<p style="text-align: center;">Previous learning</p>	<p style="text-align: center;">Future learning</p>
<ul style="list-style-type: none"> • <i>Identify common appliances that run on electricity. (Y4 - Electricity)</i> • <i>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. (Y4 - Electricity)</i> • <i>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. (Y4 - Electricity)</i> • <i>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. (Y4 - Electricity)</i> • <i>Recognise some common conductors and insulators, and associate metals with being good conductors. (Y4 - Electricity)</i> 	<ul style="list-style-type: none"> • <i>Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge. (KS3)</i> • <i>Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current. (KS3)</i> • <i>Differences in resistance between conducting and insulating components (quantitative). (KS3)</i> • <i>Static electricity. (KS3)</i>
<p style="text-align: center;">Working Scientifically opportunities</p>	<p style="text-align: center;">Enquiry Skills opportunities</p>
<ul style="list-style-type: none"> • Answer questions by investigating • Take accurate measurements • Develop predictions • Present results in line graph. • Use diagrams to support explanation • Scientific diagrams 	<ul style="list-style-type: none"> • Identify electrical components. • Notice patterns in my investigation. • Comparative tests. • Fair test • Using research • Identify components
<p style="text-align: center;">Related scientists</p>	<p style="text-align: center;">Common Misconceptions</p>



<p>Nikola Tesla (Electrical & Mechanical Engineer who developed the AC electrical system and made important advances in technologies such as x-rays, neon lights and robotics) Alessandro Volta (Physicist who developed the electric battery) Mildred S Dresselhaus (Materials Scientist whose research led to the development of the rechargeable batteries in all modern electronic equipment)</p>				
Yr 6 Explorify links	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
	https://explorify.uk/en/activities/odd-one-out/battery-bonanza		https://explorify.uk/en/activities/who-is/haydn-francis	

Year 6: Living Things and their Habitats (Spring 1)	
<ul style="list-style-type: none"> Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics. 	
<p>Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.</p>	
<p>By the end of this unit, children should know: (substantive/key knowledge)</p>	<p>By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge)</p> <p><i>Possible evidence:</i></p>
<ul style="list-style-type: none"> Know that grouping things helps scientists identify gaps in their research and they get an idea of what to investigate next. Know that, in 1735 (in the eighteenth century), Carl Linnaeus started the modern system of organising species of organisms into certain groups and giving them scientific names. Know that the scientific name for modern human beings is 'homo sapiens'. Putting different species into different groups according to their features is called classification. Know that a species is a class of plants or animals whose members have the same main characteristics and are able to breed with each other. Know that plants can be classified into two groups - flowering and non-flowering. 	<ul style="list-style-type: none"> Can use classification materials to identify unknown plants and animals Can create classification keys for plants and animals Can give several characteristics that explain why an animal belongs to a particular group



<ul style="list-style-type: none"> • Know that there are 3 types of microbes: Viruses, bacteria and fungi 					
Sticky Knowledge		Vocabulary			
<ul style="list-style-type: none"> • Can give examples of animals in the vertebrate groups and some of the invertebrate groups • Can compare the characteristics of animals in different groups • Can give examples of flowering and non-flowering plants 		<ul style="list-style-type: none"> • vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non-flowering. 			
Previous learning		Future learning			
<ul style="list-style-type: none"> • Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats) • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 – Living things and their habitats) 		<ul style="list-style-type: none"> • Differences between species. (KS3) 			
Working Scientifically opportunities		Enquiry Skills opportunities			
<ul style="list-style-type: none"> • I can record in a table • I can answer my own questions. • I can use classification keys. • I can raise questions about animals to group. • I can observe and raise questions. • I can predict how microorganisms will decay food • I can evaluate effects of yeast. 		<ul style="list-style-type: none"> • Sort based on observable characteristics. • Classify and sort using classification keys. • Research genus and species. • Research animals to classify • Observe microorganisms over time. • Notice patterns. 			
Related scientists		Common Misconceptions			
<p>Agnes Arber (<i>Botanist and first woman to become a fellow of the Royal Society who studied aquatic flowering plants and monocots, a group of flowering plants</i>)</p> <p>Hu Xiansu (<i>Botanist and founder of plant taxonomy in China</i>)</p> <p>Beatrix Potter (<i>Mycologist, study of fungi, and Scientific Illustrator</i>)</p>		<ul style="list-style-type: none"> • all micro-organisms are harmful • mushrooms are plants. 			
Yrs 5 and 6 Explorify links Living things and their habitats	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
	Tangling brambles Sudden downpour	Super seeds	Puddle pals The drinks menu	Seeds	What if there were no deserts?



Year 6: Evolution and Inheritance (Spring 2)	
<ul style="list-style-type: none"> • <i>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</i> <ul style="list-style-type: none"> • <i>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</i> • <i>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</i> 	
Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) Possible evidence:
<ul style="list-style-type: none"> • Know that characteristics are passed from parents to their offspring. • Know that variation in offspring over time can make animals more or less able to survive in particular environments. • Charles Darwin is well-known for studying evolution and created lots of theories • Know that Genes determine what eye colour, hair colour, height and even things like ear lobe shape. These are called inherited characteristics • Know that fossilisation is the process that forms fossils. Know that a fossil is 'the remains or impression of a prehistoric plant or animal embedded in rock and preserved in petrified form' 	<ul style="list-style-type: none"> • <i>Can identify characteristics that will make a plant or animal suited or not suited to a particular habitat</i> • <i>Can link the patterns seen in the model to real examples</i> • <i>Can explain why the dominant colour of the peppered moth changed over a very short period of time</i>
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • <i>Can explain the process of evolution</i> • <i>Can give examples of how plants and animals are suited to an environment</i> • <i>Can give examples of how an animal or plant has evolved over time e.g. penguin, peppered moth</i> • <i>Give examples of living things that lived millions of years ago and the fossil evidence we have to support this</i> • <i>Can give examples of fossil evidence that can be used to support the theory of evolution</i> 	<ul style="list-style-type: none"> • Offspring, adapted, environment, inherited, species, fossils, Variety, Inherited feature, Environmental feature, Desert, Polar regions, Breed, Natural Selection, Prehistoric, variation, generation
Previous learning	Future learning



<ul style="list-style-type: none"> • 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. (Y2 - Living things and their habitats) • Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans) • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants) • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) • Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats) • Describe the life process of reproduction in some plants and animals. (Living things and their habitats - Y5) 	<ul style="list-style-type: none"> • Heredity as the process by which genetic information is transmitted from one generation to the next. (KS3) • A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model. (KS3) • The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection. (KS3) • Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction. (KS3)
<p>Working Scientifically opportunities</p>	<p>Enquiry Skills opportunities</p>
<ul style="list-style-type: none"> • I can use ideas from secondary sources to support my ideas. • I can raise questions about a range of phenomena • I can develop predictions not based on results of a scientific enquiry but using own ideas and subject knowledge. • I can focus on scientific reasons for overall patterns rather than comparisons. • I can use scientific diagrams and labels to explain abstract concepts. • I can describe and evaluate my own and other people's scientific ideas supported by evidence. • I decide which secondary sources will help to answer my questions. 	<ul style="list-style-type: none"> • I can identify scientific evidence that has been used to support or refute ideas or arguments • I can talk about and explain my research using scientific knowledge and understanding • I can identify patterns • I draw valid conclusions when sorting and classifying. • I can present my findings including explanations in oral and written forms.
<p>Related scientists</p>	<p>Common Misconceptions</p>
<p>Charles Darwin Mary Anning (Fossil hunter who developed the theory that dinosaurs had become extinct a long time ago) Alfred Wallace (best known for his work on the theory of natural selection)</p>	



Nettie Stevens (<i>Geneticist who concluded that sex is inherited as a chromosomal factor and that males determine the gender of offspring</i>)					
Yr 6 Explorify links Evolution and inheritance	Observing changes over time	Noticing patterns	Grouping and classifying	Comparative or fair tests	Using secondary sources
	Alien Shapes	On thin ice	Perfect pinchers	How much variation is there in how we look?	What if we could bring back woolly mammoths?

Year 6: Animals incl. Humans (Summer 2)	
<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. 	
Biology: Biology is the study of all living things and how they grow, live together, and interact with their environment.	
By the end of this unit, children should know: (substantive/key knowledge)	By the end of this unit, children should be able to apply their knowledge in familiar related contexts, including a range of enquiries. (Disciplinary knowledge) <i>Possible evidence:</i>
<ul style="list-style-type: none"> • Know the circulatory system is the system that circulates blood through the body. • Know that diet can impact on lifestyle as fatty rich foods can clog arteries and veins, • preventing blood from delivering what is needed. • Know that some exercises are called cardiovascular and are designed to improve the fitness of the overall circulatory system by strengthening the organs and pulse rate. 	<ul style="list-style-type: none"> • Use the role play model to explain the main parts of the circulatory system and their role • Can use subject knowledge about the heart whilst writing conclusions for investigations • Can explain both the positive and negative effects of diet, exercise, drugs and lifestyle on the body • Present information e.g. in a health leaflet describing impact of drugs and lifestyle on the body
Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> • Can draw a diagram of the circulatory system and label the parts and annotate it to show what the parts do 	Heart, pulse, rate, pumps, blood, blood vessel, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle.



<ul style="list-style-type: none"> • Can recognise the impact of diet, exercise, drugs and lifestyle on the way their body's function • Can describe the ways in which nutrients and water are transported within animals, including humans. 	
<p>Previous learning</p>	<p>Future learning</p>
<ul style="list-style-type: none"> • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - 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. (Y3 - Animals, including humans) • Describe the simple functions of the basic parts of the digestive system in humans. (Y4 - Animals, including humans) • Identify the different types of teeth in humans and their simple functions. (Y4 - Animals, including humans) 	<ul style="list-style-type: none"> • • The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases. (KS3) • The effects of recreational drugs (including substance misuse) on behaviour, health and life processes. (KS3) • The structure and functions of the gas exchange system in humans, including adaptations to function. (KS3) • The mechanism of breathing to move air in and out of the lungs. (KS3) • The impact of exercise, asthma and smoking on the human gas exchange system. (KS3)
<p>Working Scientifically opportunities</p>	<p>Enquiry Skills opportunities</p>
<ul style="list-style-type: none"> • I can use scientific diagrams, models and labels to explain processes. • I can take accurate measurements and record in a table. • I can use labelled diagrams to support my explanation about the structure of blood. • I can focus on scientific reasons for why things happen and use models to explain my thinking. • I can plan my investigations and record my results. 	<ul style="list-style-type: none"> • I can identify and classify parts of the body and the heart. • I can identify parts of blood and create a model to explain my thoughts. • I can use research and scientific vocabulary to support my explanations. • I can plan a comparative test. • I can use research to support the presentation of my ideas.
<p>Related scientists</p>	<p>Common Misconceptions</p>
<p><u>William Harvey</u> (Doctor who discovered the nature of blood circulation and the function of the heart as a pump)</p> <p><u>Santorio Santorio</u> (Doctor who invented an instrument to measure pulse accurately using a pendulum and did the first scientific study of the metabolism)</p> <p><u>Richard Doll</u> (Doctor who proved the link between lung cancer and smoking)</p>	



<p><u>Ruth Ella Moore</u> (Bacteriologist who researched immunology, blood groups and tuberculosis)</p> <p><u>James Miranda Steuart Barry</u> (Doctor - born Margaret Bulkley, who went to medical school by presenting as male and lived the rest of his life as a man – who became Inspector General of military hospitals and improved conditions for wounded soldiers, native inhabitants, and performed the first caesarean section in Africa)</p>					
<p>Yrs 5 and 6 Explorify links Animals including humans</p>	<p>Observing changes over time</p>	<p>Noticing patterns</p>	<p>Grouping and classifying</p>	<p>Comparative or fair tests</p>	<p>Using secondary sources</p>
	<p><u>Coming out to play</u> <u>Very hungry caterpillars</u></p>	<p><u>Get your blood pumping</u></p>	<p><u>Terrific tree dwellers</u> <u>Light makers</u></p>	<p><u>Does colour affect how we taste things?</u></p>	<p><u>What if the average lifespan of a human was 200?</u></p>

NC Coverage throughout KS1 and KS2

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Seasonal Changes	XXXX					
Animals Including Humans	X	X	X	X	X	X
Plants	X	X	X			
Materials/States of matter	X	X		X	X	
Living Things and their Habitats		X		X	X	X
Rocks and Soils			X			
Electricity				X		X
Sound				X		
Light			X			X
Forces/Magnets			X		X	



Evolution						X
Earth and Space					X	
Famous Scientists	X	X	X	X	X	X

Progression of Children's Substantive Knowledge National Curriculum statements in red are from other linked topics.

Plants	
Nursery	<ul style="list-style-type: none"> • Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties. • Plant seeds and care for growing plants. • Understand the key features of the life cycle of a plant and an animal. • Begin to understand the need to respect and care for the natural environment and all living things.
Reception	<ul style="list-style-type: none"> • Draw information from a simple map. (Reception – Living things and their habitats) • Explore the natural world around them. (Reception – Living things and their habitats) • Describe what they see, hear and feel whilst outside. (Reception – Living things and their habitats) • Recognise some environments that are different to the one in which they live. (Reception – Living things and their habitats) • Understand the effect of changing seasons on the natural world around them. (Reception – Seasonal changes)
Year 1	<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	<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. • Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)
Year 3	<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	<ul style="list-style-type: none"> • Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats) • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats) • Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
Year 5	<ul style="list-style-type: none"> • Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)



Year 6	<ul style="list-style-type: none"> • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. (Y6 - Living things and their habitats) • Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)
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Living things and their habitats	
Nursery	<ul style="list-style-type: none"> • Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties. • Begin to understand the need to respect and care for the natural environment and all living things.
Reception	<ul style="list-style-type: none"> • Draw information from a simple map. • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Recognise some environments that are different to the one in which they live.
Year 1	<ul style="list-style-type: none"> • Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) • Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans) • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans) • Observe changes across the four seasons. (Y1 - Seasonal change)
Year 2	<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. • Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals including humans)
Year 3	<ul style="list-style-type: none"> • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)
Year 4	<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. • Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans)
Year 5	<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.



Year 6	<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. • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. (Y6 – Evolution and inheritance) • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. (Y6 – Evolution and inheritance)
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Animals, including humans	
Nursery	<ul style="list-style-type: none"> • Use all their senses in hands-on exploration of natural materials. • Begin to make sense of their own life-story and family's history. • Understand the key features of the life cycle of a plant and an animal. • Begin to understand the need to respect and care for the natural environment and all living things.
Reception	<ul style="list-style-type: none"> • Talk about members of their immediate family and community. • Name and describe people who are familiar to them. • Recognise some environments that are different to the one in which they live.
Year 1	<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	<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. • 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. (Y2 - Living things and their habitats)
Year 3	<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	<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.
Year 5	<ul style="list-style-type: none"> • Describe the changes as humans develop to old age. • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats) • Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)



Year 6	<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. • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. (Y6 - Living things and their habitats) • Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)
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Evolution and inheritance	
Nursery	<ul style="list-style-type: none"> • Begin to understand the need to respect and care for the natural environment and all living things. (Nursery – Living things and their habitats)
Reception	<ul style="list-style-type: none"> • Recognise some environments that are different to the one in which they live. (Reception – Living things and their habitats)
Year 1	
Year 2	<ul style="list-style-type: none"> • 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. (Y2 - Living things and their habitats) • Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)
Year 3	<ul style="list-style-type: none"> • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)
Year 4	<ul style="list-style-type: none"> • Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
Year 5	<ul style="list-style-type: none"> • Describe the life process of reproduction in some plants and animals. (Living things and their habitats - Y5)
Year 6	<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.

Seasonal changes	
Nursery	<ul style="list-style-type: none"> • Understand the key features of the life cycle of a plant and an animal. (Nursery – Plants & Animals, excluding humans)
Reception	<ul style="list-style-type: none"> • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Understand the effect of changing seasons on the natural world around them.
Year 1	<ul style="list-style-type: none"> • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.
Year 2	
Year 3	<ul style="list-style-type: none"> • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light)



Year 4	
Year 5	• Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. (Y5 - Earth and space)
Year 6	

Materials	
Nursery	<ul style="list-style-type: none"> • Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties. • Talk about the differences between materials and changes they notice.
Reception	<ul style="list-style-type: none"> • Explore the natural world around them. • Describe what they see, hear and feel whilst outside.
Year 1	<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	<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.
Year 3	<ul style="list-style-type: none"> • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks) • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) • 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. (Y3 - Forces and magnets)
Year 4	<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. • Recognise some common conductors and insulators, and associate metals with being good conductors. (Y4 - Electricity)
Year 5	<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.
Year 6	

Rocks	
Nursery	<ul style="list-style-type: none"> • Use all their senses in hands-on exploration of natural materials. (Nursery – Living things and their habitats) • Explore collections of materials with similar and/or different properties. (Nursery – Living things and their habitats)
Reception	<ul style="list-style-type: none"> • Explore the natural world around them. (Reception – Living things and their habitats) • Describe what they see, hear and feel whilst outside. (Reception – Living things and their habitats)
Year 1	<ul style="list-style-type: none"> • Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) • Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)
Year 2	<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. (Y2 - Uses of everyday materials)
Year 3	<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	
Year 5	
Year 6	<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. (Y6 - Evolution and inheritance)

Light	
Nursery	<ul style="list-style-type: none"> • Explore how things work. • Talk about the differences in materials and changes they notice.
Reception	<ul style="list-style-type: none"> • Describe what they see, hear and feel whilst outside.
Year 1	<ul style="list-style-type: none"> • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials)
Year 2	
Year 3	<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.



	<ul style="list-style-type: none"> • 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	
Year 5	<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. (Y5 - Properties and changes of materials)
Year 6	<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.

Forces	
Nursery	<ul style="list-style-type: none"> • Explore how things work. • Explore and talk about different forces they can feel. • Talk about the differences between materials and changes they notice.
Reception	<ul style="list-style-type: none"> • Explore the natural world around them. • Describe what they see, hear and feel whilst outside.
Year 1	
Year 2	<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. (Y2 - Uses of everyday materials)
Year 3	<ul style="list-style-type: none"> • Compare how things move on different surfaces. • Notice that some forces need contact between two 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 two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing.
Year 4	
Year 5	<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.
Year 6	

Sound



Nursery	<ul style="list-style-type: none"> • Explore how things work.
Reception	<ul style="list-style-type: none"> • Describe what they see, hear and feel whilst outside.
Year 1	<ul style="list-style-type: none"> • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)
Year 2	
Year 3	
Year 4	<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.
Year 5	
Year 6	

Electricity	
Nursery	<ul style="list-style-type: none"> • Explore how things work.
Reception	
Year 1	
Year 2	
Year 3	
Year 4	<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.
Year 5	
Year 6	<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.



Earth and space	
Nursery	
Reception	<ul style="list-style-type: none"> • Explore the natural world around them. • Describe what they see, hear and feel whilst outside.
Year 1	<ul style="list-style-type: none"> • Observe changes across the four seasons. (Y1 – Seasonal changes) • Observe and describe weather associated with the seasons and how day length varies. (Y1 – Seasonal changes)
Year 2	
Year 3	
Year 4	
Year 5	<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	