EYFS Curriculum Map – Science 2025-2026

	EYFS: Understanding the world					
Topic	**Animals including humans and Sound**	**Materials and Forces**	**Living things and their habitats**	**Energy – Seasonal Change**	**Plants Science Week Date TBC Theme: TBC**	**Electricity, Light and Dark, Colour**
EYFS Objectives	• Be able to identify different parts of their body • Have some understanding of a variety of healthy diets • Be able to show care and concern for living things • Know the effect exercise has on their body • Have some understanding of growth and change • Can talk about things that they have observed, including animals.	• Be able to ask questions about the place they live. • Talk about why things happen and how they work. • Discuss things that they have observed such as natural and man-made objects. • Manipulate materials to achieve a planned effect.	• Comment and question the place they live in and the natural world • Show care and concern for living things and the environment • Can talk about things they have observed such as plants and animals • Notices features of objects in their environment • Comments and asks questions about their familiar world	• Know about similarities and differences in relation to places, objects, materials and living things • Talk about the features of their own immediate environment and how environments might vary from one another • Make observations of animals and plants and explain why some things occur, and talk about changes	• Make observations of plants. • Know some names of plants, trees and flowers. • May be able to name and describe different plants, trees and flowers. • Show care for their world around them.	• Some understanding that objects need electricity to work • May understand that a switch will turn something on or off • Notice and describe different sounds
Future learning	**In Year 1 children will:** • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	**In Year 1 children will:** • Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including wood, metal, plastic, glass, water and rock • Describe the simple physical properties of a variety of everyday materials. • Compare and group together a variety of everyday materials based on their simple properties	**In Year 1 children will:** • 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	**In Year 1 children will:** • Observe changes across the four seasons • Observe and describe weather associated with the seasons and how day length varies.	**In Year 1 children will:** • Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. • Identify and describe the basic structure of a variety of common flowering plants. • Identify and name the roots, trunk, branches and leaves of trees.	**In Year 4 children will:** • 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. • Safety when using electricity etc.
Big Question Link	**What can we see, touch, hear, smell, see?** Why should we eat healthy food? Why should we eat a variety of food? Why do we need to sleep/exercise/clean ourselves? **What do you think is inside you?** **What do you hear inside/outside?** Are the sounds you can hear high, low, loud, quiet? Can you guess what my sound clips are? How do we hear sounds? How can we make sounds?	**What happens when I squash, twist and bend things?** How are materials the same? Different? What materials can we find in our classroom? What will happen when I heat this? Cool this? Put this in water? How can we change this material? What will happen to this material if we do this? Where do we get biscuits from? Can you make a small world using only natural materials? **How can we feel a force?**	**How are animals different?** How do animals change? Do baby animals look the same as their parents? What can babies do?	**What are the seasons? How are they different?** How do the seasons change? What clothes do we need for each season? How do we protect ourselves from cold and hot weather? What can we use wind for? What does snow look like with a magnifying glass?	**How are plants different?** How do plants change? What do plants need to grow? How can we help plants to grow?	**How do we use electricity safely?** What do we use electricity for at school and at home? What does a switch do? What needs electricity to work? **Can we see in the dark?** If there is no light, can we see? **What colours do you know?** What colour is this? What is your friend's favourite colour? How can we change this colour? (Marbling, paint mixing, filters etc)
Scientific Vocabulary	Humans: Head, neck, arms, legs, elbows, knees, face, ears, eyes, nose, hair, mouth, teeth Sense, smell, taste, touch, see, hear.	Sand, water, clay, paper. Pour, squash, stretch, bend, mix. Hard/soft, rough/smooth, bendy, stretchy, prickly, spiky, fluffy, melt, change, float, sink, push, pull, move	Animals: ears, tail, chrysalis, cocoon, caterpillar, butterfly, tadpole, frog, life cycle, change	Spring, Summer, Autumn, Winter, hot, cold, light, dark. Weather vocab – rain, wind, snow, ice.	Names of flowers and trees found in outdoor area – daisy, dandelion, daffodil, tulip, ash, oak. Plant parts – root, stem, leaf, bulb, seed Plant, flower, leaf, fruit, vegetable, water	Electricity, energy, light, dark, day, night, sun, moon, switch, safe, torch, battery, shiny, dull
Concepts and Understanding (Sticky knowledge)	Animals can be the same or different. Some things in our world are living, some are not living. We are all special because we are all different. We hear sounds with our ears. Different objects can make different sounds.	Materials are different. We can change some materials by ourselves. Some materials are natural. Some materials are made by people. I can make things move.	There are many types of animals. Animals change as they grow. We can look after animals.	There are 4 seasons: Spring, Summer, Autumn and Winter. Seasons are different. Weather can be hot, cold, windy, rainy, stormy. Weather changes.	There are many types of plants. Plants change as they grow. Plants grow from seeds. We can look after plants.	
Scientific enquiry ideas	**Comparative tests:** How are you the same/different to your friend? Who is the tallest? Shortest? **Identify and classify:** What colour hair/eyes are in our class? What sounds	**Comparative tests:** What does sand/clay/paper etc feel like? Which materials float/sink?	**Comparative tests:** Which animal is the tallest? Heaviest? Shortest? Thinnest? How are these mini-beasts different?	**Comparative tests:** What was the weather like yesterday? Is it the same/different to today? **Identify and classify:** What is the weather like today?	**Comparative tests:** What sort of plants can we see in our playground? How is this different/same to that? **Identify and classify:** What plant is this?	**Comparative tests:** Draw day and night, how are they different? **Identify and classify:** Which of these items need electricity to work? What colour is this?

	can we hear around the school? What things at home make noises? **Observation over time:** How much do our bodies grow in 1 year? **Pattern Seeking:** Make palm, foot, finger prints **Research:** Why do we have ears/eyes/fingers/ nose/ tongue? What sort of foods do we eat?	**Identify and classify:** Link to plants: Which plant did this fruit/vegetable come from? **Observation over time**: Link to food: What happens to the ingredients when we bake biscuits? What happens when we water in the freezer? **Pattern Seeking:** Which of these materials are magnetic? How can I make a toy car move faster/slower? **Research:** Which material makes the best umbrella?	**Identify and classify:** Which animal belongs in which home? **Observation over time:** How do the birds/insects in our playground change? **Pattern Seeking:** Where do animals live? Why do they like to live there? **Research:** What questions do we have about animals? Investigate bears (We're going on a bear hunt)	**Observation over time:** What happens to shadows/puddles through the day? **Pattern Seeking:** What might the weather be like tomorrow? **Research:** Can we find out how strong the wind is today?	**Observation over time:** What happens to the school plants during the year? **Pattern Seeking:** Do all leaves look the same? Do they all have a stem? Are they all green? Which seed grows the best? **Research:** What questions do we have about plants? Where do plants come from?	**Observation over time:** What time does it get light/dark outside? Does this change over the year? **Pattern Seeking:** What happens if we do this…? (Mirrors and torches) **Research:** What must we think about when we use electricity? What questions would you like to ask about electricity?
TAPS assessment tasks	'Taste tests' (evaluating)	'Making butter' (record/communicate) 'Incy Spider Shelter' (simple tests)	'Browning apples' (predict)			
Cross Curricular Links	**Cultural Capital:** **History:** Growth and change: baby-toddler-child **Geography:** **P.S.H.E.** Link to exercise on Trim Trail and using our ears to listen. **English Texts:** **Writing Outcome:**	**Cultural Capital:** **History:** **Geography:** **English Texts:** **Writing Outcome:**	**Cultural Capital:** **History:** **Geography:** **English Texts:** We're going on a bear hunt Isn't it a beautiful meadow? The Hungry Caterpillar The very busy spider Otto Blotter Bird Spotter (Graham Carter) **Writing Outcome:**	**Cultural Capital:** **History:** **Geography:** **English Texts:** Autumn is here (Heidi Pross Gray) Robin's winter song (Suzanne Barton) Snow (Walter de la Mare) **Writing Outcome:**	**Cultural Capital:** **History:** **Geography:** **English Texts:** **Writing Outcome:**	**Cultural Capital:** **History:** **Geography:** **English Texts:** **Writing Outcome:**
Key Scientists						

Year 1 Curriculum Map – Science

	Year 1					
Topic	**Animals including humans** ("My body")	**Living things and their habitats** ("Identifying animals")	**Energy** ("Seasonal changes")	**Link to D.T. unit** ("Stable structures")	**Materials** ("Everyday materials") **Science Week Theme:**	**Plants** "Identifying plants")
NC Objectives	• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	• 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	• Observe changes across the four seasons • Observe and describe weather associated with the seasons and how day length varies.	**Use materials learning from previous term to link to Plan Bee D.T. unit "Stable Structures":** **To design, build and evaluate a toy car garage.** I can explore a range of materials and evaluate the usefulness of their properties for a particular project.	• Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including wood, metal, plastic, glass, water and rock • Describe the simple physical properties of a variety of everyday materials. • Compare and group together a variety of everyday materials based on their simple properties	• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. • Identify and describe the basic structure of a variety of common flowering plants. • Identify and name the roots, trunk, branches and leaves of trees.
Prior learning	**In Early Years children should:** • be able to identify different parts of their body. • have some understanding of healthy food and the need for variety in their diets. • be able to show care and concern for living things. • know the effects exercise has on their bodies. • have some understanding of growth and change. • talk about things they have observed, including animals	**In Early Years children should:** • be able to identify different parts of their body. • have some understanding of healthy food and the need for variety in their diets. • be able to show care and concern for living things. • know the effects exercise has on their bodies. • have some understanding of growth and change. • talk about things they have observed, including animals	**In Early Years children should:** • develop an understanding of change. • observe and explain why certain things may occur (e.g. leaves falling off trees, weather changes). • look closely at similarities, differences, patterns and change. • comment and question about the place they live or the natural world.	*Other sample topics:* ***Buildings*** *• Which rocks are the least crumbly? • Which materials absorb the most water?* *• Which type of brick would be the easiest to drag to make a pyramid?* *• Which material would be the strongest to use as a floor tile?*	**In Early Years children should:** • ask questions about the place they live • talk about why things happen and how things work • discuss the things they have observed such as natural and found object • manipulate materials to achieve a planned effect	**In Early Years children should:** • make observations of plants • know some names of plants, trees and flowers • be able to name and describe different plants, trees and flowers • show some care for their world around them
Future learning	**In Year 2 children will:** • Know that animals, including humans, have offspring which grow into adults • Know the basic stages in a life cycle for animals, including humans. • Find out and describe the basic needs of animals, including humans, for survival (water, food and air). • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	**In Year 2 children will:** • Know that animals, including humans, have offspring which grow into adults • Know the basic stages in a life cycle for animals, including humans. • Find out and describe the basic needs of animals, including humans, for survival (water, food and air). • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	**In Year 3 children will:** • recognise that they need light in order to see things and that dark is the absence of light. • notice that light is reflected from surfaces. • recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • recognise that shadows are formed when the light from a light source is blocked by a solid object. • find patterns in the way that the sizes of shadows change.	***Toys and fun:*** *• Which fabric would make the softest blanket?* *• The baby has spilt her drink, which material would absorb the drink the best?* *• We want to make a really slippery slide; which liquid would be best to use?* *• Which chocolate will melt the fastest on a warm plate (a model of a warm hand)* *• Which wrapping papers are strong enough to wrap and send a present?*	**In Year 2 children will:** • 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 shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	**In Year 2 Children will:** • Observe and describe how seeds and bulbs grow into mature plants. • Find out and describe how plants need water, light and warmth to grow and stay healthy.
Big Question Link	**How do our bodies work?** • What are the names of our main body parts? • What are our body parts used for? • What are the 5 senses? Why are they all important? • How do we use our senses? • How are smell and taste linked? • Which of our senses is the most accurate at identifying food?	**What are animals like?** • What do animals eat? • Do all animals eat the same food? • Do all animals hunt? • Why do animals have different colours and patterns?	**What is it like in Winter, Spring, Summer and Autumn?** • How long does it take for the ground to dry after it has been raining? • Does more rain take longer to dry? • How does rainfall and temperature change over time in our school grounds? • Which leaf is the strongest/best shade cover/best at directing water? • Why do you think leaves turn brown in Winter? • What colours can we find outside? Does this change across the seasons?	***Clothing & Materials*** *• Which material could be used to make a waterproof hat for the teacher on duty?* *• Which plastic would be flexible enough to make a belt?* *• Which material could I wrap my ice egg/snowman in to stop it melting, or would it make it melt quicker?* *• What could I wrap a chicken egg in to keep it warm when it is waiting to hatch?* *• What could you paint on the runaway gingerbread man that would allow him to swim the river and get away from the fox and not turn to mush?*	**What are the things I use made from?** *It is recommended that materials be taught three times through KS1. Give a theme for each topic e.g. buildings, exploration, toys, the seaside. Plan to investigate a couple of classes of materials and properties in each topic so children get a depth of experience each topic and cover all the classes of materials over the key stage.*	**How many types of plant are there?** • How do plants grow? • What do plants need to grow? • Do all plants need water? • Are all plants green? • Why do seeds look different? • Can plants grow as big in the shade? • What is the biggest/smallest/smelliest (etc) tree/flower/plant on the planet?

			• What effect does rain have on the environment? • What would happen if there was too much/not enough rain?			
Scientific Vocabulary	Sense, sight, hearing, touch, taste, smell, head, neck, ear, mouth, shoulder, hand, fingers, leg, foot, thumb, eye, nose, knee, toes, teeth, elbow	Amphibians, birds, fish, mammals, reptiles, carnivores, herbivore, omnivore,	Seasons, spring, summer, autumn, winter, windy, sunny, overcast, snow, rain, temperature	Hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy/not bendy, waterproof/not waterproof, absorbent, opaque, wood, plastic, cardboard, paper, stable, pillar, ramp, level.	Hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy/not bendy, waterproof/not waterproof, absorbent, opaque	Leaves, trunk, branch, root, seed, bulb, flower, stem, wild, garden, deciduous, evergreen
Concepts and Understanding (Sticky knowledge)	• Animals, including humans, have senses to help them survive. When animals sense things they are able to respond. • Animals' 5 senses are sight, hearing, taste, touch and smell	• There are many different animals with different characteristics. • Animals need food to survive. • Animals need a variety of food to help them grow, repair their bodies, be active and stay healthy.	• Weather can change • There are lots of different types of weather: rain, sun, cloud, wind, snow etc • Days are longer and hotter in the summer • Days are shorter and colder in the winter • There are four seasons: Spring, Summer, Autumn, Winter	• There are many different materials with different properties. • Toy car garages have levels, ramps and pillars • 'Stable' means unlikely to fall over	• There are many different materials with different properties. • Materials that have similar properties are grouped into metals, rocks, fabrics, wood, plastic and ceramics (including glass). • The properties of a material determine whether they are suitable for a purpose	• Plants grow from seeds/bulbs • Plants need light and water to grow and survive • Plants are important • We can eat lots of plants
Plan Bee Working Scientifically skills	• I can carry out a blind test to identify familiar smells. • I can gather facts about the sense of smell to answer questions. • I can taste different fruits and use appropriate vocabulary to describe them.	• I can use a Venn diagram to sort animals to show which are herbivores, carnivores and omnivores. • I can use a tally chart to gather data about our class's favourite pet. • I can use a tally chart to gather information about minibeasts I spot. • I can use information I have gathered in tally charts to answer simple questions.	• I can transfer data from a tally chart into a pictogram to show what seasonal clothing was worn. • I can use collected data to answer questions.		• I can follow instructions to perform a simple test to see whether a material is waterproof or not. • I can use my observations to suggest which materials would be best for an umbrella.	• I can observe plants closely and draw my findings. • I can use a simple classification key to identify wild flowers. • I can use close observation to explain how a seed changes to a plant.
Scientific enquiry ideas	**Comparative and fair tests:** Which smells are easy/hard to guess? **Identify and classify:** What are the names for all the parts of our bodies? What are the 5 senses? **Observation over time:** How does my height change over the year? **Pattern Seeking:** **Research:** How are our senses of smell and taste linked?	**Comparative and fair tests:** Is our sense of smell better when we cannot see? **Identify and classify:** How can we organise all the zoo animals? **Observation over time:** How does a tadpole change over time? **Pattern Seeking:** Do you get better at smelling as you get older? **Research:** Do all animals have the same senses as humans?	**Comparative and fair tests:** In which season does it rain the most? **Identify and classify:** How could you organise all the objects in the solar system into groups? **Observation over time:** How does the colour of a UV bead change over the day? **Pattern Seeking:** Does the wind always blow the same way? **Research:** Are there plants that are in flower in every season? What are they?	**Comparative and fair tests:** Which material can support the greatest weight; plastic, wood, cardboard? **Identify and classify:** What are the features of a toy car garage? **Observation over time**: What happens to our model structure if we leave it outside? Which material remained stable and protected the car? **Pattern Seeking:** **Research:** What does *stable* mean? What are the different kinds of toy car garages? How are car parking garages different around the world?	**Comparative and fair tests:** Which materials are the most flexible? Which materials are the most absorbent? **Identify and classify:** We need to choose a material to make an umbrella. Which materials are waterproof? **Observation over time:** What happens to materials over time if we bury them in the ground? What happens to shaving foam over time? **Pattern Seeking:** Is there a pattern in the types of materials that are used to make objects in a school? **Research:** How are bricks made? Which materials can be recycled?	**Comparative and fair tests:** Which type of compost grows the tallest sunflower? Which tree has the biggest leaves? **Identify and classify:** How can we sort the leaves that we collected on our walk? **Observation over time:** How does a daffodil bulb/my sunflower/ cress seeds/ the oak tree change over the week/year? **Pattern Seeking:** Do trees with bigger leaves lose leaves first in autumn? Is there a pattern in where we find moss growing in school grounds? **Research:** What are most common British plants and where can we find them? How did Beatrix Potter help our understanding of mushrooms and toadstools?
Cross Curricular Links	**Cultural Capital:** What foods have we tasted that are sour/sweet/salty? **History:** Arrival of spices in Europe; trade. **Geography:** **English Texts:** One Year with Kipper (Mick Inkpen) Snail Trail (Ruth Brown) Superworm (Julia Donaldson & Axel Scheffler) **Writing Outcome:**	**Cultural Capital:** Our own pets, animals in Corsham/Wiltshire **History:** Importance of sheep/wool in Corsham; Pound, Flemish weavers **Geography:** **English Texts:** One Year with Kipper (Mick Inkpen) Snail Trail (Ruth Brown) Superworm (Julia Donaldson & Axel Scheffler) **Writing Outcome:**	**Cultural Capital:** Seasonal change in our school/Corsham. Use Colchester Zoo camera trap to identify animals in our local area **History:** **Geography:** **English Texts:** Tree: Seasons Come, Seasons Go (Patricia Hegarty and Britta Teckentrup) One Year with Kipper (Mick Inkpen) After the Storm (Nick Butterworth **Writing Outcome:**	**Cultural Capital:** Own experiences in parking garage; Bath, Chippenham, Bristol **History:** **Geography:** **English Texts:** Hansel and Gretel (Bethan Woollvin) Not a stick (Antoinette Portis) **Writing Outcome:**	**Cultural Capital:** **History:** **Geography:** **English Texts:** The Great Paper Caper (Oliver Jeffers) Who Sank the Boat (Pamela Allen) The Story of Cinderella (Walt Disney) **Writing Outcome:** Instructions for waterproofing	**Cultural Capital:** Plants in our school/Corsham **History:** **Geography:** **English Texts:** Tree: Seasons Come, Seasons Go (P Hegarty, B Teckentrup) A Little Guide to Wild Flowers (Charlotte Voake) The Things That I LOVE about TREES (Chris Butterworth) Harry's Hazelnut (Ruth Parsons) **Writing Outcome:**

			Comparisons, descriptions. Diary/record observations from camera trap.			
TAPS assessment tasks	'Body parts' (observe)	'Animal classification' (identify/classify)	'Seasonal change' (observe/record data)	'Bridge testers' (collect data)	'Floating and sinking' (simple test) 'Testing reflectiveness' (sorting/questioning) 'Ways to test transparency' (sorting/questioning) 'Bridge testers' (collect data)	'Leaf looking' (observe) 'Plant structure' (observe)
Key Scientists		Chris Packham (Animal Conservationist)	Dr Steve Lyons (Extreme Weather) Holly Green (Meteorologist)	Ole Kirk Christiansen (Inventor of Lego)	William Addis (Toothbrush Inventor) Charles Mackintosh (Waterproof coat) John McAdam (roads)	Beatrix Potter (Author and botanist)

Year 2 Curriculum Map – Science

	Year 2					
Topic	**Animals including humans** ("Growth and survival")	**Materials** ("Exploring everyday materials")	**Living things and their habitats** ("Living in habitats")	**Forces: Link to D.T. unit** ("Vehicles")	**Plants** ("Growing plants") **Science Week Theme:**	**Forces/Light/Electricity** ("Super scientists")
NC Objectives	• Know that animals, including humans, have offspring which grow into adults • Know the basic stages in a life cycle for animals, including humans. • Find out and describe the basic needs of animals, including humans, for survival (water, food and air). • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	• 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 shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	• Explore and compare the difference between things that are living, dead and things that have never been alive. • Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. • Identify and name a variety of plants and animals in their habitats, including micro habitats. • Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name the different sources of food.	**Use materials learning from previous term to link to Plan Bee D.T. unit "Vehicles":** I can investigate a range of vehicles to design, construct and evaluate a moving vehicle.	• Observe and describe how seeds and bulbs grow into mature plants. • Find out and describe how plants need water, light and warmth to grow and stay healthy	**This unit covers:** Isaac Newton; gravity/light Florence Nightingale; germs/disease Joseph Lister; germs/disease Alexander Fleming; germs/disease Thomas Edison; light/electricity
Prior learning	**In Year 1 children should:** • 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.	**In Year 1 children should:** • Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including wood, metal, plastic, glass, water and rock, • Describe the simple physical properties of a variety of everyday materials. • Compare and group together a variety of everyday materials based on their simple properties.	**In Early Years children should:** • Comment and question about the place they live or the natural world. • Show care and concern for living things and the environment. • Talk about things they have observed such as plants and animals. • Notice features of objects in their environment. • Comment and question about their familiar world.	**In Early Years children should:** • know about similarities and differences in relation to places, objects, materials and living things. • talk about the features of their own immediate environment and how environments might vary from one another. • make observations of animals and plants, explain why some things occur, and talk about changes.	**In Year 1 Children should:** • Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. • Identify and describe the basic structure of a variety of common flowering plants. • Identify and name the roots, trunk, branches and leaves of trees.	**In Early Years children should:** • know about similarities and differences in relation to places, objects, materials and living things. • talk about the features of their own immediate environment and how environments might vary from one another. • make observations of animals and plants, explain why some things occur, and talk about changes.
Future learning	**In Year 3 children will:** • Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. • Know how nutrients, water and oxygen are transported within animals and humans. • Know about the importance of a nutritious, balanced diet. • Identify that humans and some other animals have skeletons and muscles for support, protection and movement:	**In Year 3 children will:** • Compare and group together different kinds of rocks based on 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.	**In Year 4 children will:** • 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. • Know and label the features of a river • Recognise that environments can change and that this can sometimes pose danger to living things.	**In Year 3 children will:** • Compare how things move on different surfaces. • Know how a simple pulley works and use making lifting an object simpler • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract and repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials. • Describe magnets as having two poles.	**In Year 3 Children will:** • Identify and describe the functions of different parts of the flowering plant: roots, stem/trunk/leaves and flowers • Explore the part flowers play in a flowering plant's life cycle, including pollination, seed formation and seed dispersal • Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plants • Know the way in which water is transported between plants	**In Year 3 children will:** • Compare how things move on different surfaces. • Know how a simple pulley works and use to making lifting an object simpler • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract and repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials.

				• Predict whether two magnets with attract or repel each other, depending on which poles are facing.		• Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing.
Big Question Link	**Do living things change or stay the same?** • How long do/should pets live for? • Do all animals grow and live the same way? • Do bigger animals live longer? • Why are we all different heights? • How and why do we grow and change?	**Can we change materials?** **How do we choose the best material?** **Sample topics:** **Buildings:** • Which rocks are the least crumbly? • Which materials absorb the most water? • Which material would be the strongest to use as a floor tile? **Toys and fun:** • Which fabric would make the softest blanket? • The baby has spilt her drink, which material would absorb the drink the best? • We want to make a really slippery slide; which liquid would be best to use? • Which chocolate will melt the fastest on a warm plate (a model of a warm hand) • Which wrapping papers are strong enough to wrap and send a present? **Clothing & Materials** • Which material could be used to make a waterproof hat for the teacher on duty? • Which plastic would be flexible enough to make a belt? • Which material could I wrap my ice egg / snowman in to stop it melting, or would it make it melt quicker? • What could I wrap a chicken egg in to keep it warm when it is waiting to hatch? • What could you paint on the runaway gingerbread man to allow him to swim the river, get away from the fox and not turn to mush?	**Why do different animals live in different places?** • How do animals eat? • Do all animals eat the same thing? • Which animals hunt, and which animals are hunted? Why? • What animals live in our school environment? • How are animals and plants 'adapted' to live in their habitats • Why do animals and plants like to live in different places? • How do seasons affect our animals and plants? • Which animals hibernate and why? • Why do snails hibernate, but slugs do not? • How do habitats change over our school year? **(Link to next term's British Science Week 10-19 March 2023)**	**How does a vehicle move?** • How can we move objects? • How can we change the way an object moves? • How does a material affect how fast a ball rolls down a slope? • How does the length/steepness of a slope affect how far a ball/car/tin will roll off the end? • Was it a push or a pull that makes it go further? • On what surface do objects roll the best on? Is it the same for sliding?	**What should I do to grow a healthy plant?** • Does cress produce seeds? How could we find out? • Do all plants produce flowers and seeds? • What is different between freshly cut and planted flowers? • Do plants flower all year round? • What are flowers for? • What happens to a plant after it has produced seeds?	**Which scientist made the greatest impact on our world?** • Is gravity different on the moon?
Scientific Vocabulary	Growth, survival, extinct, baby, parent, adult, pregnant, gestation, mammal, reptile, amphibian, bird, fish, habitat, environment, food, proportion, healthy, balanced, diet, water, air (oxygen), nutrition, hygiene, exercise	Waterproof, fabric, rubber, cars, rock, paper, cardboard, wood, metal, plastic, glass, brick, twisting, squashing, bending, matches, cans, spoons	Living, dead, never alive, habitats, micro-habitats, food, food chain, leaf litter, shelter, seashore, woodland, ocean, rainforest, conditions, desert, damp, shade	Force, push, pull, surface, friction, ramp, wheels, tyres *D.T. vocab: Vehicle, wheels, base, body, axle, chassis*	Leaves, trunk, branch, root, seed, bulb, flower, stem, wild, garden, deciduous, evergreen, observe, grow, compare, record, temperature, predict, measure, diagram, germinate, warmth, sunlight.	Germ, disease, reflex, hygiene, gravity, force, light, colour, prism, telephone, bulb, circuit, battery, wire
Concepts and Understanding (Sticky knowledge)	• All animals, including humans, have offspring that grow into adults. • The young of some animals do not look like their parents. • Animals grow until maturity and then do not grow any larger. • Animals need food, water, air and shelter in order to survive. • It is important we eat a healthy, balanced diet. • Exercise keeps animal bodies in good condition and increases survival chances.	There are many different types of materials with different properties. Some materials can be changed by twisting, bending, squashing and stretching. Some materials cannot be changed.	• Some things are living, some were once living but now dead, and some things never lived. • There is variation between living things. • Different animals and plants live in different places. Living things are adapted to survive in different habitats. • Environmental change can affect plants and animals that live there.	• Pushing and pulling can make things move faster or slower. • Pushing and pulling can make things move or stop. • Things can move in different ways. • Larger masses take bigger pushes and pulls to move or stop them. • Pushing and pulling can change the shape of things. • Bigger pushes and pulls have bigger effects	• Plants grow from seeds/bulbs • Plants need light, water and warmth to grow and survive • Flowers make seeds to make more plants (reproduce) • Plants are important • We need plants to survive (to clean air, to eat) • We can eat different parts of the plants (leaves, stems, roots, seeds, fruit)	• Nightingale, Lister and Fleming discovered how to prevent germs and diseases. • Newton identified gravity as a force •Gravity is a force that makes thing fall to the ground •Newton discovered sunlight is made of different colours that we see as white light. • White light can be split using a prism • Edison invented the first light bulb to last more than 12 hours
Plan Bee Working Scientifically skills	• I can carry out my own research using simple sources to find out what a particular animal needs in order to survive.	• I can suggest different ways of sorting materials based on their properties and characteristics. • I can sort materials into those that are natural and those that are man-made. • I can experiment with what happens to different materials when you bend, twist,	• I can classify things that are living, things that are dead and things that have never been alive. • I can explore and observe microhabitats in the local environment. • I can experiment with ways of separating a variety of materials from		• I can carry out an experiment to observe how the roots of a bulb grow. • I can use close observation to examine different fruits to see how many seeds they have, making predictions beforehand.	• I can answer questions I have generated and suggest how to find answers to questions that I haven't answered yet. • I can observe what happens when light passes through a prism and record my findings.

		stretch and squash them, recording my observations. • I can make predictions about how materials will behave. • I can experiment with ways of making a paper bridge that is strong enough to hold a toy car.	water, choosing suitable equipment for the task.		• I can plan and set up an experiment to find out which conditions are best for seed germination. • I can suggest how to make an experiment a fair test. • I can use the results of my experiment to draw a diagram explaining the best conditions for seed germination. • I can use observation to explain how a seed changes over time.	• I can generate questions to help find out about Alexander Graham Bell and his invention of the telephone. • I can carry out investigations to explore how sound travels using a string telephone. • I can carry out an investigation to explore the effect adding paper clips to a spinner has on the length of time it takes the spinner to reach the ground. • I can design a marble run with the intention of it taking the longest possible time for the marble to reach the ground. • I know that scientists discover new things and make advances because they ask questions and work out how to find the answers. • I can carry out simple tests to test my reflexes, recording the results systematically in a table. • I can carry out an experiment to see how many germs are on our hands before and after we wash them. • I can make predictions about what will happen in an experiment.
Scientific enquiry ideas	**Comparative and fair tests:** How does the length of time we exercise for affect our heart rate? Can exercising regularly affect your lung capacity? Which type of exercise has the greatest effect on our heart rate? **Identify & Classify:** Which organs of the body make up the circulation system, and where are they found? **Observation over time:** How does a tadpole change over time? How does my heart rate change over the day? How much exercise do I do in a week? **Pattern Seeking**: Is there a pattern between what we eat for breakfast and how fast we can run? **Research:** How have our ideas about disease and medicine changed over time?	**Comparative and fair tests:** Which shapes make the strongest paper bridge? Which material would be best for little pig's roof/an umbrella? **Identify and classify:** Which materials will float and which will sink? Which materials will let electricity go through them, and which will not? Which materials are shiny and which are dull? **Observation over time:** How long do bath bubbles last for? What will happen to our snowman? **Pattern Seeking:** How do materials change with heat? (Leave outside in sunshine/on windowsill/on radiator) How does amount of water affect the strength of a kitchen towel? **Research:** How have the materials we use changed over time? How are plastics made?	**Comparative and fair tests:** Which pets are the easiest to look after? Is there the same level of light in the evergreen wood compared with the deciduous wood? **Identify and classify:** How would you group these plants and animals based on what habitat you would find them in? **Observation over time:** How does the school garden/field/wild area change over the year? **Pattern Seeking:** What conditions do woodlice prefer to live in? Which habitat do worms prefer – where can we find the most worms? **Research:** How are the animals in ___ different to the ones that we find in Britain? How does the habitat of the Arctic compare with the habitat of the rainforest? What ideas did botanist Arthur Tansley have about habitats in 1935?	**Comparative and fair tests:** Which material would be best for tyres? **Identify and classify:** **Observation over time:** **Pattern Seeking:** How does changing the force change the speed of a toy car? **Research:**	**Comparative and fair tests:** Do cress seeds grow quicker inside or outside? **Identify and classify:** How can we identify the trees that we observed on our tree hunt? **Observation over time:** What happens to my bean after I have planted it? **Pattern Seeking:** Do bigger seeds grow into bigger plants? **Research:** How does a cactus survive in a desert with no water?	**(All from Plan Bee unit)** **Comparative tests:** How can I create the longest possible marble run? **Identify and classify:** Which materials make the best line for a string telephone? **Observation over time:** What happens to germs on our hands if we don't wash them? **Pattern Seeking:** How does changing the number of paper clips affect how a spinner falls to ground? **Research:** How do prisms work?
Cross Curricular Links	**Cultural Capital:** **History:** Disease and medicine improvements **Geography:** **English Texts:** The Gruffalo (Julia Donaldson) Meerkat Mail (Emily Gravett) Tadpole's Promise (Jeanne Willis and Tony Ross) **Writing Outcome:** Explanation – stages of life	**Cultural Capital:** John McAdam – designed new durable roading, tested in Bristol **History:** Scottish inventors Dunlop and McIntosh **Geography:** **English Texts:** The Tin Forest (Helen Ward) https://www.youtube.com/watch?v=AP5PNOIU4ns Traction Man (Mini Grey) Three Little Pigs (Lesley Sims) **Writing Outcome:** Report – strong paper bridge. Investigation write up.	**Cultural Capital:** Micro-habitats in our school/Corsham. Use of Colchester Zoo camera trap to identify animals in our area. **History:** **Geography:** **English Texts:** The Gruffalo (Julia Donaldson) Meerkat Mail (Emily Gravett) No Place Like Home (Jonathon Emmett) **Writing Outcome:** Information/reports – habitats. Dairy/observation records from camera trap.	**Cultural Capital:** **History:** **Geography:** **English Texts:** **Writing Outcome:**	**Cultural Capital:** **History:** **Geography:** **English Texts:** The Tin Forest (Helen Ward) Jack and the Beanstalk (Richard Walker) Ten Seeds (Ruth Brown) A Seed Is Sleepy (Dianna Aston) **Writing Outcome:** Instructions – seeds. Explanations.	**Cultural Capital:** Hygiene during COVID pandemic **History:** **Geography:** **English Texts:** **Writing Outcome:** Information/reports – chosen Scientist fact-file

TAPS assessment tasks	'Comparing hand spans' (evaluate) 'Sorting living and non-living' (interpret, report, use scientific language to communicate)	'Ice escape' (observe/measure) 'Separating colours' (questioning) 'Materials hunt' (gather data/record) 'Rocket mice' (simple test) 'Boat materials' (compare) 'Waterproof materials' (questioning)	'Daisies in a footprint' (predict) 'Nature spotters' (identify/classify) 'Woodlice habitat' (gather data, record)	'Forces. Cars down ramps' (record) *This is a Y3 task.*	'Compare plant growth in different conditions' (observe)	'Rocket mice' (simple test) 'Boat materials' (compare)
Key Scientists	Steve Irwin (Crocodile Hunter) Robert Winston (Human Scientist) Joe Wicks (Personal Trainer)	William Addis (Toothbrush Inventor) Charles Mackintosh (Waterproof coat) John McAdam (roads)	Terry Nutkins (TV Presenter) Liz Bonnin (Conservationist)	Henry Ford (cars)	Agnes Arber (Botanist) Alan Titchmarsh (Botanist & Gardener)	Wright Brothers (aeroplanes)

Year 3 Curriculum Map – Science

	Year 3					
Topic	**Animals including humans** ("Health and movement")	**Energy** ("Light and shadows")	**Forces** ("Forces and magnets")	**Materials** ("Rocks, fossils and soils")	**Plants** ("How plants grow") **Science Week Theme:**	**Plants** **+ Famous Scientists?**
NC Objectives	• Identify that animals, including humans, need the right types and amount of nutrition, and cannot make their own food; they get their nutrition from their diet. • Know how nutrients, water and oxygen are transported within animals and humans. • Know the importance of a nutritious, balanced diet. • Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	• Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by a solid object. • Find patterns in the way that the sizes of shadows change.	• Compare how things move on different surfaces. • Know how a simple pulley works and use making lifting an object simpler • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract and repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials based on whether they are attracted to a magnet; identify some magnetic materials. • Describe magnets as having two poles. • Predict whether two magnets with attract or repel each other, depending on which poles are facing.	• Compare and group together different kinds of rocks based on their appearance and simple physical properties • Describe in simple terms how fossils are formed; things that have lived are trapped within rock • Recognise that soils are made from rocks and organic matter	• Identify and describe the functions of different parts of the flowering plant: roots, stem/trunk/leaves and flowers • Explore the part flowers play in a flowering plants life cycle, including pollination, seed formation and seed dispersal • Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plants • Know the way in which water is transported between plants	• Identify and describe the functions of different parts of the flowering plant: roots, stem/trunk/leaves and flowers • Explore the part flowers play in a flowering plants life cycle, including pollination, seed formation and seed dispersal • Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plants • Know the way in which water is transported between plants

Prior learning	**<u>In Year 2 children should:</u>** • Know that animals, including humans, have offspring which grow into adults • Know the basic stages in a life cycle for animals, including humans. • Find out and describe the basic needs of animals, including humans, for survival (water, food and air). • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	**<u>In Year 1 children should have:</u>** • Observed changes across the four seasons • Observed and described weather associated with the seasons and how day length varies. **<u>Children may:</u>** • have some knowledge of where light comes from. • have seen their shadows and may know they appear when it is sunny. • Have some understanding of a reflection. • May understand they need light to be able to see things.	**<u>In Year 2 children:</u>** • May have an awareness of how to make things stop and start, using simple pushes and pulls. • They may know about floating and sinking.	**<u>In Year 2 children should:</u>** • 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 shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. **<u>Children may:</u>** • May have some understanding of a variety of different rocks in the natural world. • Some understanding of what soil is. (how to identify soil etc) • May have some knowledge of what a fossil is.	**<u>In Year 2 children should:</u>** • Observe and describe how seeds and bulbs grow into mature plants. • Find out and describe how plants need water, light and warmth to grow and stay healthy.	**<u>In Year 2 children should:</u>** • Observe and describe how seeds and bulbs grow into mature plants. • Find out and describe how plants need water, light and warmth to grow and stay healthy.
Future learning	**<u>In Year 4 children will:</u>** • 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	**<u>In Year 6 children will:</u>** • 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. • Know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.	**<u>In Year 5 children will:</u>** • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • Explain the impact of gravity on our lives. • Identify the effects of air resistance, water resistance and friction, which act between moving surfaces. • Recognise that some mechanisms e.g. levers, pulleys, and gears, allow a smaller force to have a greater effect. • Describe movement of Earth, and other planets, relative to the Sun in the solar system • Describe movement of the Moon relative to Earth • Describe the Sun, Earth and Moon as approximately spherical bodies • Describe the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	**<u>In Year 4 children will:</u>** • Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **<u>In Year 6 children will:</u>** • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.	**<u>In Year 6 children will:</u>** • Recognise that living things have changed over time and that fossils provide information about living things • 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 can lead to evolution.	**<u>In Year 6 children will:</u>** • Recognise that living things have changed over time and that fossils provide information about living things • 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 can lead to evolution.
Big Question Link	**Why do animals have skeletons? What is a healthy diet and why is it important?** • Why do we need a skeleton? • What types of skeleton are there? Are all skeletons the same? • Can something survive without a skeleton? • What happens if we break a bone? • How do we move? • Are bones that are bigger, stronger? • Why do we need joints? • Why do muscles get tired? • Can we 'break' muscles?	**What is a shadow?** • A coin is lost, what would be the best way to find it? (Turn the lights out and see it shine? Use a torch to see it reflect?) • How does distance from a light source affect how bright it looks? • How does being in darkness affect your sense of hearing? • What colour would be the best to make a safety jacket from? • How does the colour of a material affect how reflective it is? • What would be the best material to make a blind for a baby's room? • How does thickness of a material affect how much light can pass through it? • How many pieces of tracing paper are as translucent as a single piece of white paper? • How does the shape of a mirror affect how the light reflects? • How can we change the darkness, size and shape of a shadow?	**How can we move magnets?** • What are magnetic materials? How can we find out? • Can I make a magnetic material non-magnetic? • How far away does a magnet have to be before it attracts a magnetic material? • How far away can the magnetic attraction between two magnets be experiences? • Is the repulsive force the same size? • How is the magnetic attraction of repulsion force affected by putting materials between the magnets? • Are bigger magnets stronger? • How could you use magnets to measure the number of pages in a book?	**What are rocks and soils like?** • How are the soils different? • Which do you think has best drainage? • Which is more likely to lead to flooding? • How many soil types have we found? • How might the soil be different in different countries? • What rock is best for a kitchen chopping board? What might be the issues with various materials and what they must withstand? • What types of rocks are there? • How do rocks change? • Why do you think worms are important to the creation of soil? • How can we use composting to make our own soil? • How long do you think the compost process will take and why? • How are fossils created? • Why do fossils help us find out about historical events?	**Why do plants have flowers?** • How do plants reproduce? • Do all flowers look the same? • How do insects know which flowers to pollinate? • Why do flowers smell? • What do seeds do? • Can a plant live without its leaves? • Do grass/trees make flowers? • What conditions are perfect for a seed to grow? • Where do weeds come from? • How does the space between seeds affect how well they grow? • Does seed size match plant size? • Do plants take in water through their roots? • How does water move through the plant? • How do plants make their food? • How does light affect plant growth? • How does a plant get carbon dioxide?	**Why do plants have flowers?** • How do plants reproduce? • Do all flowers look the same? • How do insects know which flowers to pollinate? • Why do flowers smell? • What do seeds do? • Can a plant live without its leaves? • Do grass/trees make flowers? • What conditions are perfect for a seed to grow? • Where do weeds come from? • How does the space between seeds affect how well they grow? • Does seed size match plant size? • Do plants take in water through their roots? • How does water move through the plant? • How do plants make their food? • How does light affect plant growth? • How does a plant get carbon dioxide?

				• If you could fossilise an object what would it be?		
Scientific Vocabulary	Nutrients, nutrition, carbohydrates, protein, fats, vitamins, minerals, water, fibre, skeleton, bones, joints, endoskeleton, exoskeleton, hydrostatic skeleton, vertebrates, invertebrates, muscles, contract, relax	Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent.	Force, push, pull, friction, surface, magnet, magnetic, magnetic field, pole, north, south, attract, repel, compass	Rocks, igneous, metamorphic, sedimentary, anthropic, permeable, impermeable, chemical fossil, body fossil, trace fossil, Mary Anning, cast fossil, mould fossil, replacement fossil, extinct, organic matter, topsoil, sub soil, base rock.	Air, light, water, nutrients, soil, support, anchor, reproduction, pollination, dispersal, transportation, flower, energy, growth, seedling, carbon dioxide, oxygen, sugar, material, photosynthesis, chlorophyll	Air, light, water, nutrients, soil, support, anchor, reproduction, pollination, dispersal, transportation, flower, energy, growth, seedling, carbon dioxide, oxygen, sugar, material, photosynthesis, chlorophyll
Concepts and Understanding (Sticky knowledge)	• Different animals are adapted to eat different foods. • Many animals have skeletons to support their bodies and protect vital organs. • Muscles are connected to bones and move them when they contract. • Movable joints connect bones.	• There must be light for us to see. Without light it is dark. • We need light to see things, even shiny things. • Transparent materials let light travel through them, and opaque materials don't let light through. • Beams of light bounce off some materials (reflection). • Shiny materials reflect light beams better than non-shiny materials. • Light comes from a source	• Magnets exert attractive and repulsive forces on each other. • Magnets exert non-contact forces, which work through some materials. • Magnets exert attractive forces on some materials. • Magnet forces are affected by magnet strength, object mass, distance from object and object material.	• There are different types of rock. • There are different types of soil. • Soils change over time. • Different plants grow in different soils. • Fossils tell us what has happened before. • Fossils provide evidence. • Palaeontologists use fossils to find out about the past. • Fossils provide evidence that living things have changed over time.	• Plants are producers, they make their own food. Their leaves absorb sunlight and carbon dioxide • Plants have roots which provide support and draw water from the soil • Flowering plants have specific adaptations which help them carry out pollination, fertilisation and seed production • Seed dispersal improves chances of successful reproduction • Seeds/bulbs require the right conditions to germinate and grow. • Seeds contain enough food for the plant's initial growth	• Plants are producers, they make their own food. Their leaves absorb sunlight and carbon dioxide • Plants have roots which provide support and draw water from the soil • Flowering plants have specific adaptations which help them carry out pollination, fertilisation and seed production • Seed dispersal improves chances of successful reproduction • Seeds/bulbs require the right conditions to germinate and grow. • Seeds contain enough food for the plant's initial growth
Plan Bee Working Scientifically skills	• I can classify a variety of foods into different food groups. • I can carry out my own research to find out what foods different animals eat, and record my findings. • I can generate questions to investigate to find out what pets eat. • I can gather data in a tally chart and convert the results into a pictogram. • I can use data to draw conclusions and find the answer to my question. • I can label a diagram of the human skeleton. • I can use a variety of sources of information to find out how invertebrates protect themselves and report my findings. • I can ask and answer questions about muscles. • I can make different movements with my body and explain which muscles I am using.	• I can identify a variety of light sources around my school. • I can predict which light sources would be strongest, comparing my predictions with a partner and discussing any differences. • I can explain in my own words why we have night and day, using appropriate vocabulary. • I can test whether an object is transparent, translucent or opaque by testing what kind of shadow it casts. • I can explain which shadow diagram is correct, using what I know about how shadows are formed. • I can investigate how shadows behave, finding ways to make shadows move and make them longer and shorter. • I can record results from my shadow experiments using diagrams. • I can predict what I think will happen to a shadow throughout the day. • I can carry out an experiment to find out what happens to shadows throughout the day, recording my results in a table. • I can draw conclusions from my shadow investigation to say what I have found out. • I can experiment with using mirrors to see around corners.	• I can carry out a fair test to explore whether objects need the same force to move them across different surfaces. • I can make predictions about the results of my investigation. • I can use my results to draw conclusions. • I can explore whether magnets attract or repel when north poles and south poles are put together. • I can draw diagrams to show the results of my findings. • I can predict which materials will be magnetic and which will not, then test my hypothesis. • I can carry out my own research to find out about uses for magnets and report my findings.	• I can classify rocks that are natural and those that are man-made. • I can identify a variety of natural and man-made rocks in my local environment. • I can suggest which criterion has been used to sort rocks into two groups. • I can sort rocks into Venn diagrams and Carroll diagrams based on specific criteria. • I can use my own criteria for sorting rocks into a Carroll diagram. • I can generate ideas for an experiment to test different rocks to see how much they erode. • I can carry out an experiment to test the erosion rate of different rocks, making predictions and recording my findings appropriately. • I can use a variety of sources of information to help me find out about specific rocks and their uses. • I can use observation to explore different soil samples and rank them according to different criteria. • I can classify fossil samples according to various criteria.	• I can observe root growth over a period of time and record my observations in a table. • I can generate ideas for an experiment to test water transportation in plants. • I can plan, set up and carry out an experiment to show how water is transported in plants, making a prediction and recording my observations. • I can make a comic strip to explain the process of pollination, using vocabulary such as stamen, stigma, ovary, nectar and petals. • I can classify plants according to their seed dispersal method. • I can taste test a variety of different seeds. • I can gather data about our class's favourite seeds in a chart. • I can ask and answer questions about the seed data I have gathered.	• I can observe root growth over a period of time and record my observations in a table. • I can generate ideas for an experiment to test water transportation in plants. • I can plan, set up and carry out an experiment to show how water is transported in plants, making a prediction and recording my observations. • I can make a comic strip to explain the process of pollination, using vocabulary such as stamen, stigma, ovary, nectar and petals. • I can classify plants according to their seed dispersal method. • I can taste test a variety of different seeds. • I can gather data about our class's favourite seeds in a chart. • I can ask and answer questions about the seed data I have gathered.
Scientific enquiry ideas	**Comparative and fair tests:** How does the angle that your elbow/knee is bent affect the circumference of your upper arm/thigh? How does the skull circumference of a girl compare with that of a boy? **Identify and classify:** How do the skeletons of different animals compare? **Observation over time:** How does our skeleton change over time? (from birth to death) **Pattern Seeking:** Do male humans have larger skulls than female humans? **Research:** Why do different types of vitamins keep us healthy and which foods can we find them in?	**Comparative and fair tests:** How does the distance between the shadow puppet and the screen affect the size of the shadow? Which pair of sunglasses will be best at protecting our eyes? **Identify and classify:** How would you organise these light sources into natural and artificial sources? **Observation over time:** When is our classroom darkest? Is the Sun the same brightness all day? **Pattern Seeking:** Are you more likely to have bad eyesight and to wear glasses if you are older? **Research:** How does the Sun make light?	**Comparative and fair tests:** How does the mass of an object affect how much force is needed to make it move? Which magnet is strongest? Which surface is best to stop you slipping? **Identify and classify:** Which materials are magnetic? **Observation over time:** If we magnetise a pin, how long does it stay magnetised for? **Pattern Seeking:** Do magnetic materials always conduct electricity? Does the size and shape of a magnet affect how strong it is? **Research:** How have our ideas about forces changed over time? How does a compass work?	**Comparative and fair tests:** How does adding different amounts of sand to soil affect how quickly water drains through it? Which soil absorbs the most water? **Identify and classify:** Can you use the identification key to find out the name of each of the rocks in your collection? **Observation over time:** How does tumbling change a rock over time? What happens when water keeps dripping on a sandcastle? **Pattern Seeking:** Is there a pattern in where we find volcanos on planet Earth? **Research:** Who was Mary Anning and what did she discover?	**Comparative and fair tests:** How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals? Which conditions help seeds germinate faster? **Identify and classify:** How many ways can you group our seed collection? **Observation over time:** What happens to celery when it is left in a glass of coloured water? How do flowers in a vase change over time? **Pattern Seeking:** What colour flowers do pollinator insects prefer? **Research:** What are all the different ways that seeds disperse?	**Comparative and fair tests:** How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals? Which conditions help seeds germinate faster? **Identify and classify:** How many ways can you group our seed collection? **Observation over time:** What happens to celery when it is left in a glass of coloured water? How do flowers in a vase change over time? **Pattern Seeking:** What colour flowers do pollinator insects prefer? **Research:** What are all the different ways that seeds disperse?

Cross Curricular Links	**Cultural Capital:** **History:** **Geography:** **English Texts:** The Story of Frog Belly Rat Bone (Tim B Ering) Funnybones (Janet and Allan Ahlberg) I Will Never Not Ever Eat a Tomato (Lauren Child) Goldilocks & the Three Bears (Samantha Berger) **Writing Outcome:** Explanations – muscles, invertebrates. Investigation - skeletons	**Cultural Capital:** Lacock's Fox Talbot Museum; first photograph taken there. **History:** **Geography:** **English Texts:** The Owl Who Was Afraid of the Dark (Jill Tomlinson) The Dark (Lemony Snicket) The Firework-Maker's Daughter (Philip Pullman) **Writing Outcome:** Information – shadows. Investigations – transparent/opaque etc.	**Cultural Capital:** **History:** **Geography:** **English Texts:** The Iron Man (Ted Hughes) Mrs Armitage: Queen of the Road (Quentin Blake) Mr Archimedes' Bath (Pamela Allen) **Writing Outcome:** Information – uses for magnets. Investigations -	**Cultural Capital:** Local Bath limestone, quarries **History:** Bath stone quarries, Box Tunnel, Brunel. **Geography:** Dorset fossils **English Texts:** The Pebble in My Pocket (Meredith Hooper) Stone Girl, Bone Girl (Laurence Anholt) The Street Beneath My Feet (Charlotte Guillain & Yuval Zommer) **Writing Outcome:** Investigations – rock erosion.	**Cultural Capital:** **History:** Aztecs plants – cacao bean **Geography:** **English Texts:** The Hidden Forest (Jeannie Baker) George and Flora's Secret Garden (Jo Elworthy) **Writing Outcome:** Explanation – pollination.	**Cultural Capital:** **History:** **Geography:** **English Texts:** The Hidden Forest (Jeannie Baker) George and Flora's Secret Garden (Jo Elworthy) **Writing Outcome:** Explanation – pollination.
TAPS assessment tasks	'Investigating skeletons' (questioning)	'Light making shadows' (record)	'Magnet tests' (fair test) 'Cars down ramps' (record) 'Balloon rockets' (evaluate)	'Rock reports' (interpret/record) 'Eco Action' (interpret/record)	'Function of stem' (evaluate) 'Measuring plants' (observe/ measure)	'Function of stem' (evaluate) 'Measuring plants' (observe/ measure)
Key Scientists	Adelle Davis (20th Century Nutritionist) Marie Curie (Radiation / X-Rys)	James Clerk Maxwell (Visible and Invisible Waves of Light)	William Gilbert (Magnetism) Andre Marie Ampere (Electro-Magnetism)	Mary Anning (Discovery of Fossils) Inge Lehmann (Earth's Mantle)	Jan Ingenhousz (Photosynthesis) Joseph Banks (Botanist)	Jan Ingenhousz (Photosynthesis) Joseph Banks (Botanist)

Year 4 Curriculum Map – Science

	Year 4					
Topic	**Animals including humans** ("Teeth and eating") **Term 3**	**Electricity** ("Circuits and conductors") **Term 2**	**Living things and their habitats** ("Living in environments") **Term 5: Science Week Theme:**	**Sound** ("Changing sound") **Term 1**	**Materials** ("States of Matter") **Term 4**	**Super Scientists!** (Recalling information and working scientifically) **Term 6**
NC Objectives	• 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	• 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 a lamp will light in a simple series circuit, based on whether the lamp is part of a complete loop with a battery. • Recognise that a switch opens and closes the circuit and associate this with whether a lamp lights in a simple series circuit. • Recognise some common conductors and insulators, and associate metals with being good conductors. • Know the difference between a conductor and an insulator, giving examples of each. • Safety when using electricity	• 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 danger to living things	• Know how sound is made, associating some of them with vibrating. • Know what happens to a sound as it travels from its source to our ears. • Know the correlation between the volume of a sound and the strength of the vibrations that produced it. • Know how sound travels from a source to our ears. • Know the correlation between pitch and the object producing a sound.	• Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	*No NC links BUT summarises and links to 5 topics throughout the year:* • To recognise that environments can change and that this can sometimes pose dangers to living things **by exploring Gerald Durrell's conservation work in Madagascar**. • To recognise that vibrations from sounds travel through a medium to the ear **in the context of Alexander Graham Bell's invention of the telephone.** •Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers **in the context of building a solar oven.** • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit **in the context of creating a traffic light** •To compare and group materials together according to whether they are solids, liquids or gases **by exploring the discovery of oxygen.** •To observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) **by exploring Kelvin's discovery of absolute zero.** •To identify common electrical appliances that run on electricity **by exploring Thomas Edison's and Lewis Latimer's work with Electricity.** •To identify the different types of teeth in humans and their functions **by finding out about the invention of toothpaste.**
Prior learning	**In Year 3 children should:** • Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. • Know how nutrients, water and oxygen are transported within animals and humans. • Know about the importance of a nutritious, balanced diet. • Identify that humans and some other animals have skeletons and muscles for support, protection and movement	**In Early Years children:** • May have some understanding that objects need electricity to work. • May understand that a switch will turn something on or off.	**In Year 2 children should:** • Explore and compare the difference between things that are living/ dead/ never been alive. • Identify that most living things live in habitats to which they are suited and describe how different habitats provide basic needs of different kinds of animals/plants, and how they depend on each other. • Identify and name a variety of plants and animals in their habitats/ micro habitats. • Describe how animals obtain their food from plants and other animals, using a simple food chain, identify and name different sources of food.	**In KS1 children:** • May have some understanding that objects make different sounds. • May have some understanding that they use their ears to hear sounds. • Know about their different senses.	**In KS1 children should**: • 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 based on their simple physical properties. • 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	
Future learning	**In Year 5 children will:** • Know the life cycle of different living things, e.g. Mammal, amphibian, insect bird. • Know the differences between different life cycles. • Know the process of reproduction in plants. • Know the process of reproduction in animals	**In Year 6 children will:** • 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.	**In Year 5 children will:** • Describe the differences in life cycles of a mammal, amphibian, insect and bird. • Describe the life process of reproduction in some plants and animals.	**In KS3 children will learn about**: • frequencies of sound waves measured in hertz (Hz), echoes, reflection and absorption of sound • sound needs a medium to travel, the speed of sound in air, in water, in solids • sound produced by vibrations of objects, in loudspeakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal	**In Year 5 children will:** • Compare/group everyday materials based on properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. • Know some materials dissolve in liquid to form a solution, describe how to recover a substance from a solution. • Use knowledge of solids, liquids, and gases to decide how mixtures might be	

	• Identify that humans and some other animals have skeletons and muscles for support, protection and movement:	• Use recognised symbols when representing a simple circuit in a diagram.		• auditory range of humans and animals.	separated (filtering, sieving and evaporating) • Give reasons based on evidence from comparative and fair tests, for uses of everyday materials, including wood, metals and plastic. • Demonstrate dissolving, mixing and changes of state are reversible changes. • Explain some changes result in formation of new materials, this kind of change is usually irreversible (changes associated with burning and action of acid on bicarbonate of soda.)	
Big Question Link	**What do our bodies do with the food we eat?** • What different types of food are there? • Why do we need a variety of different foods? • Do all organisms eat the same things? • Why do some people need different diets? (weightlifter vs marathon runner) • Why are teeth important? • What happens to our food? • What is our digestive system? • How does our food turn into poo and wee?	**What can we do with electricity?** • What would life be like without electricity? • What sorts of things use/need electricity? • What electricity do I use? • In which ways can we 'get' electricity? (mains/plugs/batteries/wireless) • How do we make electricity? • How do batteries work? • How quickly can batteries run out? Does this make a difference depending on number of components? • How does the number of batteries added to the circuit affect a device? • What materials can carry electricity? (conductors/insulators)	**Are living things in danger?** • What food chains and webs are there in our local habitat? • How does energy move through the food chain? • How does removal of one species from an environment affect others? (keystone species) • How does environmental change affect different organisms? • What are the most important things we could do to improve our outside area? (pond, compost, wildflowers) • How does human activity affect our environment (traffic on Corsham roads)	**(Link to British Science Week March 2023)** **How can we make different sounds?** • How can you change the volume of a sound? • How does the size of an ear trumpet affect the volume of sound detected? • How does the type of material affect how well is blocks a sound? • How does thickness of material affect how well it blocks a sound? • Which materials vibrate better and produce louder sounds? Can we identify any patterns? • Which materials make the best string telephone components? (tin cans, paper cups, plastic cups, wire, cable, string, plastic or elastic – predict and test) • How does length of the tube (when making a straw oboe) affect the pitch and volume? • Can you predict the relative pitch of tuning forks from the patterns of ripples they make in the water?	**Where do ice cubes go when they disappear? Why does it rain and hail?** • How does the amount of water added to flour affect its state? • How does the amount of detergent added to water affect how slippery it is? • How does the temperature affect how viscous a liquid is (use cooking oil)? • Place a peach in a glass of lemonade and watch it spin. Why does it behave that way, and can you prove it? • How does the material sprinkled on ice and snow affect how quickly it melts? • What chocolate would be best to smuggle? How does the type of chocolate affect its melting temperature? • What is the melting temperature of ice and how does it compare with the freezing temperature of water? • Is the melting temperature of wax the same as its freezing temperature?	**Who is the most important scientist in history?**
Scientific Vocabulary	herbivore, carnivore, omnivore, food chain, energy, producer, consumer, tooth, canine, incisor, molar, premolar, milk/adult teeth, decay, cavity, digestive system, organs, tongue, mouth, teeth, oesophagus, stomach, gall bladder, small intestine, pancreas, large intestine, liver,	electricity, electric current, appliances, mains, crocodile clips, wires, bulb, battery/cell, battery holder, motor, buzzer, switch, conductor, electrical insulator, component.	environment, flowering, non-flowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation.	Amplitude, volume, quiet, loud, ear, pitch, high, low, particles, instruments, wave	Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection,	
Concepts and Understanding (Sticky knowledge)	• Animals have teeth to help them eat. • Different types of teeth do different jobs. • Food is broken down by the teeth and further in the stomach and intestines where nutrients go into the blood. • The blood takes nutrients around the body. • Nutrients produced by plants move to primary consumers then to secondary consumers through food chains.	• A source of electricity (mains or battery) is needed for electrical devices to work. • Electricity sources push electricity round a circuit. • More batteries will push the electricity round the circuit faster. • Devices work harder when more electricity goes through them. • A complete circuit is needed for electricity to flow and devices to work. • Some materials allow electricity to flow easily and these are called conductors. Materials that don't allow electricity to flow easily are called insulators.	• Living things can be divided into groups based upon their characteristics • Environmental change affects different habitats differently • Different organisms are affected differently by environmental change • Different food chains occur in different habitats • Human activity significantly affects the environment	• Sound travels from source in all directions, we hear it when it travels to our ears. • Sound travel can be blocked. • Sound spreads out as it travels. • Changing the shape, size and material of an object will change the sound it produces. • Sound is produced when an object vibrates. • Sound moves through all materials by making them vibrate. • Changing the way an object vibrates changes its sound. • Bigger vibrations = louder sounds, smaller vibrations = quieter sounds. • Faster vibrations (higher frequencies) produce higher pitched sounds	• Solids, liquids and gases are described by observable properties. • Materials can be divided into solids, liquids and gases. • Heating causes solids to melt into liquids and liquids evaporate into gases. • Cooling causes gases to condense into liquids and liquids to freeze into solids. • The temperature at which given substances change state are always the same.	
Plan Bee Working	• I can classify a wide variety of animals to show whether they are herbivores, carnivores or omnivores.	• I can test different materials using a simple circuit to see whether they are conductors or insulators.	• I can explore my local area to see how many different habitats there are.	• I can investigate a range of objects that show visible vibrations to help me understand how sound waves work.	• I can compare and classify materials according to whether they are solids or liquids.	

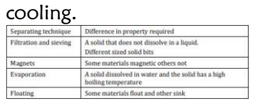
Scientificall y skills	• I can present information about how to keep teeth healthy. • I can draw a diagram to show what I think the digestive system looks like and how it works. • I can ask a variety of questions about the digestive system and use different sources to find out the answers. • I can label a diagram of the digestive system and describe how it works. • I can plan and carry out an experiment (making sure it is a fair test) to explore how acid affects the food in our stomachs.	• I can use what I found out about conductors and insulators to draw conclusions. • I can classify objects into those that are conductors and those that are insulators. • I can draw diagrams to show appliances that have conductors on the inside and insulators on the outside. • I can experiment with a variety of objects and materials in a simple circuit to create a working switch. • I can incorporate a buzzer into a circuit that makes a sound when the switch is on. I can plan, set up and carry out an investigation to find out how you can change the brightness of a bulb, making sure it is a fair test.	• I can use a variety of clues in riddles to help me identify different animals. • I can classify a variety of organisms using my own and given criteria, sorting the results into tables and Carroll diagrams. • I can use a classification key to identify which group an animal belongs to. I can use a classification key to identify unfamiliar organisms.	• I can predict how well sound will travel through a variety of different materials. • I can plan, set up and carry out an experiment to answer the question, 'Do sound waves travel through all materials equally?' • I can generate questions to investigate what happens to a sound as you get further away from it. • I can plan, set up and carry out an experiment to see which materials are best for soundproofing. • I can draw conclusions from my investigations to answer a question. • I can make predictions about the pitch and volume an instrument will produce, using my knowledge of how sound works. • I can draw a diagram to show how and why the pitch changes on a glockenspiel. • I can investigate a variety of stringed instruments to explore how the pitch changes according to the length, thickness and tightness of the string, and record my findings. I can predict which bottle would produce the highest pitch when different amounts of water are inside, then test my prediction and record my results.	• I can carry out an investigation to see if air weighs anything and report on my findings. • I can draw diagrams to show how the particles in solids, liquids and gases behave differently. • I can experiment with pneumatics and make observations about what I'm doing. • I can research the melting points of a variety of materials. • I can plan and carry out an experiment to see the different melting points of chocolate and evaluate the fairness of my experiment. • I can give different everyday processes which involve melting and freezing. • I can draw diagrams and use written examples to show the processes of evaporation and condensation. I can label a diagram of the water cycle to show what is happening.	
Scientific enquiry ideas	**Comparative tests:** In our class, are omnivores taller than vegetarians? **Identify & Classify:** What are the names for all the organs involved in the digestive system? How can we organise teeth into groups? **Observation over time:** How does an eggshell change when it is left in Cola? **Pattern Seeking**: Are foods that are high in energy always high in sugar? **Research:** How do dentists fix broken teeth? **Fair test:** Which drink is bad for our teeth? Plan Bee: How does acid affect food in our stomachs?	**Comparative tests:** How does the thickness of a conducting material affect how bright the lamp is? Which metal is the best conductor of electricity? **Identify and classify:** How would you group these electrical devices based on where the electricity comes from? **Observation over time:** How long does a battery light a torch for? **Pattern Seeking:** Which room has the most electrical sockets in a house? **Research:** How has electricity changed the way we live? How does a light bulb work?	**Comparative tests:** Does the amount of light affect how many woodlice move around? How does the average temperature of the pond water change in each season? **Identify and classify:** Can we use the classification keys to identify all the animals that we caught pond dipping? **Observation over time:** How does the variety of invertebrates on the school field change over the year? **Pattern Seeking:** How has the use of insecticides affected bee population? **Research:** How have animals adapted to living on mountains? Why are people cutting down the rainforests and what effect does that have?	**Comparative tests:** How does the volume of a drum change as you move further away from it? How does the length of a guitar string/tuning fork affect the pitch of the sound? **Identify and classify:** Which material is best to use for muffling sound in ear defenders? **Observation over time:** When is our classroom the quietest? **Pattern Seeking:** Is there a link between how loud it is in school and the time of day? If there is a pattern, is it the same in every area of the school? **Research:** Do all animals have the same hearing range?	**Comparative tests:** How does the mass of a block of ice affect how long it takes to melt? How does the surface area of water affect how long it takes to evaporate? Does seawater evaporate faster than fresh water? **Identify and classify:** Can you group these materials and objects into solids, liquids, and gases? How would you sort these objects/materials based on their temperature? **Observation over time:** Which material is best for keeping our hot chocolate warm? How does the level of water in a glass change when left on the windowsill? **Pattern Seeking:** Is there a pattern in how long it takes different sized ice lollies to melt? How does evaporation rate change as you add more salt to your water? **Research:** What are hurricanes, and why do they happen?	
Cross Curricular Links	**Cultural Capital:** **History:** Disease and medicine improvements Link to Anglo-Saxons medicine and healthcare **Geography:** **English Texts:** Human Body Odyssey (Werner Holzwarth) Crocodiles Don't Brush Their Teeth (Colin Fancy)	**Cultural Capital:** **History:** **Geography:** Christmas stockings around the world **English Texts:** Until I Met Dudley (Roger McGough) Oscar and the Bird: A Book about Electricity (Geoff Waring) Electrical Wizard: How Nikola Tesla Lit Up the World (Elizabeth Rusch) **Writing Outcome:**	**Cultural Capital:** Use camera trap on school grounds to identify which animals live here. **History:** **Geography:** Link to Natural world and natural disasters **English Texts:** The Vanishing Rainforest (Richard Platt) The Morning I Met a Whale (Michael Morpurgo)	**Cultural Capital:** Link to Georgians and trip to Theatre Roya - acoustics **History:** **Geography:** **English Texts:** Horrid Henry Rocks (Francesca Simon) Moonbird (Joyce Dunbar) The Pied Piper of Hamelin (Natalia Vasquez) **Writing Outcome:**	**Cultural Capital:** **History:** **Geography:** Link to Term 4 Natural Disasters **English Texts:** Once Upon a Raindrop: The Story of Water (James Carter) Sticks (Diane Alber) **Writing Outcome:**	**Cultural Capital:** **History:** **Geography:** **English Texts:** **Writing Outcome:** Scientist fact-file Big Write

	Wolves (Emily Gravett) **Writing Outcome:**	Writing instructions for sewing	**Writing Outcome:** Diary from camera trap observations. Record observations.			
TAPS assessment tasks	'Teeth (eggs) in liquid' (evaluate)	'Circuit products' (observe/measure) 'Conductors' (report)	'Local survey' (record)	'Investigating pitch' (questioning) 'String telephones' (report)	'Cornflour slime' (questioning) 'Drying materials' (fair test) 'Measure temperatures' (observe/measure) 'Dunking biscuits' (evaluate)	String Telephones, Solar Ovens, 'Elephant Toothpaste'
Key Scientists	Ivan Pavlov (Digestive System Mechanisms) Joseph Lister (Discovered Antiseptics)	Thomas Edison (First Working Lightbulb) Joseph Swan (Incandescent Light Bulb)	Cindy Looy (Environmental Change and Extinction) Jacques Cousteau (Marine Biologist)	Aristotle (Sound Waves) Galileo Galilei (Frequency and Pitch of Sound Waves) Alexander Graham Bell (Invented telephone)	Anders Celsius (Celsius Temperature Scale) Daniel Fahrenheit (Fahrenheit Temperature Scale / Invention of the Thermometer)	Gerald Durrell, Alexander Graham Bell, Maria Telkes, Garrett Morgan, Lord Kelvin, Thomas Edison, Lewis Latimer, Washington Sheffield.

Year 5 Curriculum Map – Science

	Year 5					
Topic	**Living things and their habitats** ("Life cycles")	**Materials** ("Properties and changes of materials")	**Animals, including humans** ("Changes and reproduction")	**Energy** ("Earth and space")	**Forces** ("Forces in action") **Science Week Theme:**	**Materials** DT project – Viking bread
NC Objectives	• Describe the changes as humans develop to old age.	• Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. • 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.	• Know the life cycle of different living things, e.g. mammal, amphibian, insect bird. • Know the process of reproduction in plants. • Know the process of reproduction in animals.	• 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 • Describe the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Explain the impact of gravity on our lives. • Identify the effects of air resistance, water resistance and friction, which act between moving surfaces. • Recognise that some mechanisms (including levers, pulleys, and gears) allow a smaller force to have a greater effect.	• Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. • comparative and fair tests, for the uses of everyday materials, including wood, metals 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 this kind of change is usually not reversible, including changes associated with burning and the action of acid on bicarbonate of soda.
Prior learning	**In Year 4 children should:** • 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.	**In KS1 children should:** • 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 based on their simple physical properties.	**In Year 4 children should:** • Construct and interpret a variety of food chains, identifying producers, predators and prey • Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. • Identify and name a variety of plants and animals in their habitats, including micro-habitats.	**In Key Stage 1 and in Year 3 children should:** • Understand changes in weather patterns and seasons. • Compare how things move on different surfaces. • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Describe magnets as having two poles. Predict whether two magnets with attract or repel each other, depending on which poles are facing	**In Year 3 children should:** • Compare how things move on different surfaces. • Know how a simple pulley works and use to making lifting an object simpler • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract and repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials based on	**In Year 4 children should:** • Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius. • Identify the part played by evaporation and condensation in the water cycle and associate the

		• 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.			whether they are attracted to a magnet and identify some magnetic materials. • Describe magnets as having two poles. • Predict whether two magnets with attract or repel each other, depending on which poles are facing.	rate of evaporation with temperature.
Future learning	**In Year 6 children will:** • 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.	**In Year 5 children will:** • Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. • Give reasons based on evidence from comparative and fair tests, for the uses of everyday materials, including wood, metals 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 this kind of change is usually not reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	**In Year 6 children will**: • Classify living things into broad groups according to observable characteristics and based on similarities and differences. • Give reasons for classifying plants and animals based on specific characteristics.	**In KS3 children will learn about:** • 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) • Our Sun as a star, other stars in our galaxy, other galaxies • The seasons and the Earth's tilt, day length at different times of year/in different hemispheres, the light year as a unit of astronomical distance	**In KS3 children will learn about:** • opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface • forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only) • change depending on direction of force and its size.	**In KS3 children will learn about:** • the concept of pure substance mixtures, including dissolving • diffusion in terms of the particle model • simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography • the identification of pure substances
Big Question Link	**Why and how does the human body change over time?** • What do humans look like? • Do all animal embryos look the same? • How do humans change? • Why do humans change? • What causes puberty? • What changes do we go through during puberty? • Are there any patterns between vertebrate animals and their gestation periods?	**How can we separate a mixture of water, iron filings, salt and sand?** • What are mixtures? • What does dissolve mean? • Which of the following dissolve in water: sugar, bicarbonate of soda, oil, chocolate, coffees, dark vinegar and wax? • How does the amount of water used affect how much sugar will dissolve in it? • Which sweets dissolve in water? • How can we separate mixtures? • How can we clean our dirty water?	**Do all plants and animals reproduce in the same way?** • What is a life cycle? What types of life cycles are there? • Are life cycles the same? • Do plants reproduce in the same ways as us? • How do plants spread their seeds?	**Sun, Earth & Moon: What is moving and how do we know?** •How does temperature/size/day length/year length change as you get closer/further to the sun? •How does distance from a light source affect how much light hits an object? •Does having more moons result in more light hitting a planet? How could you test this? •How does speed/size of a meteorite affect the size of the moon crater formed? •If the moon became heavier as a result of meteorite collisions what would happen to its position relative to Earth? •If the mass of the Earth is 80x that of the moon, why is the gravity at the Earth's surface only 6x greater than at the surface of the moon? •Why do we have day/night/months/years/seasons? •Why does day length change? •Why does shadow size change over the course of a day?	**How and why do objects move?** • What is a force? • How can a force act on an object? • How can we see forces? • How can we measure forces? • How does the saltiness (salinity) of water affect the water resistance? • How does the length of a paper helicopter's wings affect the time it takes to fall? • How does changing the shape of a piece of plasticine affect water resistance? • How does adding holes to a parachute affect the time it takes to fall? • How does the amount/depth of tread affect the friction between a shoe and a surface? • How can we use levers to lift heavy objects? • What is the most effective way to move an object? • How do see-saws work? • Can you create a pulley system to life a given load?	**How can we change materials reversibly and irreversibly?** • The key question we want children to interrogate is "have we made a new substance?" - Wet clay … air-dried clay … fired clay. - Flour and water … dough … bread • Add sugar to fizzy water; it fizzes up. Has a new substance been made? (No, the gas was dissolved in the water and adding sugar made it become undissolved) • Add baking powder to vinegar, it fizzes up. Has a new substance been made? (Yes, the gas was not in the vinegar as it was not fizzy, so it must have been made) • Add water to instant snow. • Use lemon juice as an invisible ink, heating gently makes the ink visible. Is this a new substance? • When water is added to jelly and it is set, is it a new substance? • When materials are heated or mixed with other materials they sometimes can be made to turn into new materials. The question is how would we know if it was a new material or the same material mixed differently?
Scientific Vocabulary	Foetus, embryo, womb, gestation, baby, toddler, teenager, elderly, growth, development, puberty, hormone, physical, emotional,	Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection,	Reproduction, sexual, asexual, pollination, dispersal, reproduction, cell, fertilisation, pollination, male, female, pregnancy, young, mammal, metamorphosis, amphibian, insect, egg, embryo, bird, plant	Earth, sun, moon, axis, rotation, day, night, phases of the moon, star, constellation, waxing, waning, crescent, gibbous. Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, planets, solar system, day,	Air resistance, water resistance, friction, gravity, Newton, gears, pulleys, force, push, pull, opposing, streamline, brake, mechanism, lever, cog, machine, pulley.	hardness, solubility, transparency, conductivity, magnetic, filter, evaporation, dissolving, mixing material, conductor, dissolve, insoluble, suspension, chemical, physical, irreversible, solution,

				night, rotate, orbit, axis, spherical, geocentric, heliocentric.		reversable, separate, mixture, insulator, transparent, flexible, permeable, soluble, property, magnetic, hard.
Concepts and Understanding (Sticky knowledge)	• Different animals mature at different rates and live to different ages. • Puberty is something we all go through, a process which prepares our bodies for being adults, and reproduction • Hormones control these changes, which can be physical and/or emotional.	• When two or more substances are mixed and remain present the mixture can be separated. • Some changes can be reversed, and some cannot. • Materials change state by heating and cooling.  Separating technique / Difference in property required Filtration and sieving / A solid that does not dissolve in a liquid. Different sized solid bits Magnets / Some materials magnetic others not Evaporation / A solid dissolved in water and the solid has a high boiling temperature Floating / Some materials float and other sink	• Different animals mature at different rates and live to different ages. • Some organisms reproduce sexually where offspring inherit information from both parents. • Some organisms reproduce asexually by making a copy of a single parent. • Environmental change can affect how well an organism is suited to its environment. • Different types of organisms have different lifecycles.	• Stars, planets and moons have so much mass they attract other things (including each other) due to a force called gravity. Gravity works over distance. • Objects with larger masses exert bigger gravitational forces. • Objects like planets, moons and stars spin. • Smaller mass objects like planets orbit large mass objects like stars. • Stars produce vast amounts of heat and light. • All other objects are lumps of rock, metal or ice and can be seen because they reflect the light of stars.	• Air resistance and water resistance are forces against motion caused by objects having to move air and water out of their way. • Friction is a force against motion caused by two surfaces rubbing against each other. • Some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move	• All matter (including gas) has mass. • Sometimes mixed substances react to make a new substance. These changes are usually irreversible. • Heating can sometimes cause materials to change permanently. When this happens, a new substance is made. These changes are not reversible. • Indicators that something new has been made are: The properties of the material are different (colour, state, texture, hardness, smell, temperature) • If it is not possible to get the material back easily it is likely that it is not there anymore and something new has been made (irreversible change)
Plan Bee Working Scientifically skills	• I can create a bar chart to show the gestation period of a range of animals, and use this to answer questions. • I can compare gestation periods in animals with the female animal's weight, and use this to draw conclusions. • I can write a report about the development of children from age 0 to 11. • I can label diagrams of boys and girls to show the changes that take place during puberty.	• I can mix a variety of materials with water to see whether they will dissolve, float, sink or react, recording the results in a table. • I can classify materials depending on whether they dissolve, float, sink or react when mixed with water. • I can investigate different irreversible changes by mixing different materials together, observing the results and explaining what has happened. • I can compare and classify a variety of everyday materials based on their properties. • I can carry out a variety of investigations to explore the properties of materials to see if they e.g. conduct electricity, are magnetic, are soluble, etc. • I can give reasons, based on evidence from comparative and fair tests, for uses of everyday materials. • I can plan, set up and carry out a fair test, drawing conclusions and presenting the results.	• I can label the parts of a flowering plant correctly using their scientific names. • I can dissect a flower to explore the male and female parts of the plant. • I can write scientifically accurate descriptions of asexual reproductions in plants using 100 words or less. • I can follow instructions to grow a new plant from cuttings. • I can classify a variety of animals according to how they reproduce. • I can create a scatter graph to show animal gestation and incubation periods, using the information to generate statements and answer questions. • I can research and present data and information about the organisms living in a variety of environments around the world. • I can compare the life cycles of a variety of animals. • I can carry out independent research to find out about the life and achievements of a famous naturalist.	• I can draw a labelled diagram of the Sun, Earth and Moon to show how they are related to one another. • I can create a moving model of the Sun, Earth and Moon, and write a description to describe what is happening. • I can make a simple sundial and set it up to observe how shadows change throughout the day. • I can record my observations and use these to draw conclusions. • I can use the internet to research which time zones different cities around the world are in. • I can label diagrams to show which season both the Northern and Southern Hemispheres will be experiencing depending on the Earth's position and tilt. • I can create a graph to show the average day length by month, and use the data to answer questions. • I can create a labelled diagram of the phases of the moon. • I can sort fact cards to show which apply to the geocentric and which apply to the heliocentric explanations of the solar system. • I can use the internet to explore the night sky, stating which planets and constellations will be visible on a given day. • I can carry out my own research to find out key facts about each planet in the solar system. • I can create a 3D model of the solar system.	• I can carry out an investigation to explore the effect of gravity on falling objects, taking careful measurements and observations to draw conclusions. • I can carry out independent research to find out about the roles Newton and Galileo played in helping our understanding of gravity, presenting my findings appropriately. • I can suggest ways to plan an experiment to find out which surface has the most friction when an object is moved across it. • I can carry out a fair test to explore the friction of different surfaces, recording my results accurately and using them to draw conclusions. • I can analyse a variety of statements, explaining which I agree with and why. • I can plan, set up and carry out an investigation to explore how the size of a parachute affects the speed at which it falls to the ground, recording my results appropriately and using them to draw conclusions. • I can make predictions about which shape of plasticine would fall quickest in a pot of water, giving scientific explanations for my choices. • I can carry out an experiment to test my predictions, recording my results using a stopwatch and using evidence to draw conclusions. • I can create some simple pulleys, exploring the different forces needed to pull the same object and drawing conclusions from my findings. • I can use card or construction toys to create different transmissions, exploring	

					the movement and torque of the driver and follower gears.	
Scientific enquiry ideas	**Comparative and fair tests:** How does age affect a human's reaction time? Who grows the fastest, girls or boys? **Identify and classify:** Can you identify all the stages in the human life cycle? **Observation over time:** How do different animal embryos change? **Pattern Seeking:** Is there a relationship between a mammal's size and its gestation period? **Research:** Why do people get grey/white hair when they get older?	**Comparative and fair tests:** How does the temperature of tea affect how long it takes for a sugar cube to dissolve? Which type of sugar dissolves the fastest? **Identify and classify:** Can you group these materials based on whether they are transparent or not? **Observation over time:** How does a container of saltwater change over time? How does a sugar cube change as it is put in a glass of water? **Pattern Seeking:** Do all stretchy materials stretch in the same way? How does temperature affect how much solute we can dissolve? **Research:** What are microplastics and why are they harming the planet?	**Comparative and fair tests:** How does the level of salt affect how quickly brine shrimp hatch? **Identify and classify:** Compare this collection of animals based on similarities and differences in their lifecycle. **Observation over time:** How do brine shrimp change over their lifetime? How does a bean change as it germinates? **Pattern Seeking:** Is there are relationship between number of petals and number of stamens? **Research:** What are the differences between the life cycle of an insect and a mammal?	**Comparative and fair tests:** How does the length of daylight hours change in each season? **Identify and classify:** How could you organise all the objects in the solar system into groups? **Observation over time:** Can you observe and identify all the phases in the cycle of the Moon? **Pattern Seeking:** Is there a pattern between the size of a planet and the time it takes to travel around the Sun? **Research:** What unusual objects did Jocelyn Bell Burnell discover? How do astronomers know what stars are made of? How have our ideas about the solar system changed over time?	**Comparative and fair tests:** How does the angle of launch affect how far a paper rocket will go? How does the surface area of an object affect the time it takes to sink? **Identify and classify:** Can you label and name all the forces acting on the objects in each of these situations? **Observation over time:** How long does a pendulum swing for before it stops? **Pattern Seeking:** Do all objects fall through water in the same way? How does surface area of parachute affect the time it takes to fall? **Research:** How do submarines sink if they are full of air?	**Comparative and fair tests:** Which material rusts fastest/slowest? How can we change the 'jelly-ness' of jelly? **Identify and classify:** Can you identify and classify these reactions and changes into reversible, and irreversible? Can you describe their group's similarities and differences? **Observation over time:** How does a nail in saltwater change over time? **Pattern Seeking:** What patterns can you notice in different reactions? How does the amount of bicarbonate of soda, washing up liquid and vinegar affect the reaction? Do all stretchy materials stretch the same way? **Research:** What are smart materials and how can they help us?
Cross Curricular Links	**Cultural Capital:** Identify local animals – school/Corsham/UK **History:** **Geography:** **English Texts:** Hair in Funny Places (Babette Cole) Giant (Kate Scott) You're Only Old Once! (Dr. Seuss) **Writing Outcome:** Information – cloning plants. Reports – famous naturalists. Instructions – plant cuttings.	**Cultural Capital:** **History:** **Geography:** **English Texts:** Itch (Simon Mayo) Kensuke's Kingdom (Michael Morpurgo) The BFG (Roald Dahl) **Writing Outcome:** Reports/Explanations – irreversible mixtures. Investigations – conductors/magnetic/soluble	**Cultural Capital:** **History:** **Geography:** **English Texts:** The Land of Neverbelieve (Norman Messenger) Mummy Laid an Egg (Babette Cole) **Writing Outcome:** Reports – child development	**Cultural Capital:** **History:** **Geography:** **English Texts:** The Skies Above My Eyes (Charlotte Guillain & Yuval Zommer) George's Secret Key to the Universe (Lucy and Stephen Hawking with Christophe Galfard) The Way Back Home (Oliver Jeffers) **Writing Outcome:** Explanation – geo/heliocentric. Information – planets, solar system.	**Cultural Capital:** **History:** **Geography:** **English Texts:** The Enormous Turnip (Katie Daynes) Leonardo's Dream (Hans de Beer) The Aerodynamics of Biscuits (Clare Helen Welsh) **Writing Outcome:** Investigations – parachutes, friction, gravity. Information – Newton, Galileo	**Cultural Capital:** **History:** Vikings (leather and materials) **DT:** Baking bread **Geography:** **English Texts:** Itch (Simon Mayo) Kensuke's Kingdom (Michael Morpurgo) The BFG (Roald Dahl) **Writing Outcome:**
TAPS Assessment tasks	'Life cycle research' (interpret/report)	'Champion tapes' (interpret) 'Sugar cubes' (record) 'Zipline testing' (fair test) 'Insulation layers (fair test) 'Nappy absorbency' (questioning) 'Dissolving' (questioning)	'Growth survey' (observe/measure)	'Solar system' (research) 'Space – craters' (record)	'Bridge engineers' (evaluate) 'Marble run' (evaluate) 'Aqua-dynamics' (interpret/report) 'Bottle flip' (record) 'Titanic pulleys' (observe) 'Spinners' (observe) 'Paper planes' (questioning)	
Key Scientists	Dr Steve Jones (Geneticist) Prof Robert Winston (Human Scientist) Mary Agnes (Botanist) David Attenborough (Broadcaster/Natural historian)	Spencer Silver, Arthur Fry and Alan Amron (Post-It Notes) Ruth Benerito (Wrinkle-Free Cotton) Stephanie Kwolek (Chemist)	James Brodie of Brodie (Reproduction of Plants by Spores) David Attenborough (Naturalist and Nature Documentary Broadcaster)	Claudius Ptolemy and Nicolaus Copernicus (Heliocentric vs Geocentric Universe) Neil Armstrong (First man on the Moon) Helen Sharman (First British astronaut) Tim Peake (First British ESA astronaut) Mae Jemison (Female black astronaut)	Galileo Galilei (Gravity and Acceleration) Isaac Newton (Gravitation) Archimedes of Syracuse (Maths/engineer/inventor - levers) John Walker (The Match) Albert Einstein (Theoretical physicist)	Spencer Silver, Arthur Fry and Alan Amron (Post-It Notes) Ruth Benerito (Wrinkle-Free Cotton) Stephanie Kwolek (Chemist)

Year 6 Curriculum Map – Science

	Year 6					
Topic	**Animals including humans** ("Healthy bodies")	**Evolution and Inheritance** ("Evolution and inheritance")	**Living things and their habitats** ("Classification")	**Electricity** ("Circuits")	**Light and Sight** ("Light") **Science Week Theme:**	**"Great Scientists"** (Twinkl unit)
NC Objectives	• 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.	• Know about evolution and can explain what it is. • Know how fossils can be used to find out about the past. • 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- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago	• Classify living things into broad groups according to observable characteristics and based on similarities and differences. • Give reasons for classifying plants and animals based on specific characteristics.	• 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.	• 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. • Know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.	• To report and present findings from enquiries, including causal relationships, in oral and written forms such as displays and other presentations (Context: Stephen Hawking and his findings on black holes) •To give reasons for classifying plants and animals based on specific characteristics (Context: Libbie Hyman's classifying of vertebrates and invertebrates) •To recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function (Context: Marie Maynard Daly's findings on diet and circulatory system health). •To record data using scatter graphs (Context: Fleming's discovery of penicillin) •To recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago (Context: Mary Leakey's fossil findings in the Olduvai Gorge) •To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. (Context: Dr Daniel Hale Williams - parts and functions of the circulatory system.) •To use recognised symbols when representing a simple circuit in a diagram (Context: invention of Apple computers and the life of Steve Jobs.)
Prior learning	**In Year 5 children should:** • Describe the changes as humans develop to old age.	**From Key Stages 1 & 2, children should:** • Understand there is a variety of life on Earth • Know that some animals' differences are important to their survival • Know how animals and plants reproduce • Know how fossils form over time	**In Year 4, children should**: • 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 danger to living things.	**In Year 4, children should:** • 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 a lamp will light in a simple series circuit, based on whether the lamp is part of a complete loop with a battery. • Recognise that a switch opens and closes the circuit and associate this with whether a lamp lights in a simple series circuit.	**In Year 3 children should:** • Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by a solid object. • Find patterns in the way that the sizes of shadows change.	

				• Recognise some common conductors and insulators, and associate metals with being good conductors. • Know the difference between a conductor and an insulator, giving examples of each. • Safety when using electricity.		
Future learning in KS3	**In Key Stage 3 children will learn about:** • the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms. • the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts) • calculations of energy requirements in a healthy daily diet • the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases • the structure and functions of the gas exchange system in humans, including adaptations to function • the effects of recreational drugs (including substance misuse) on behaviour, health and life processes.	**In Key Stage 3 children will learn about:** • heredity as the process by which genetic information is transmitted from one generation to the next • the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation • the variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection • 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 • the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.	**In Key Stage 3 children will learn about:** • the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere • the adaptations of leaves for photosynthesis. • the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops • the importance of plant reproduction through insect pollination in human food security • how organisms affect, and are affected by, their environment, including the accumulation of toxic materials.	**In Key Stage Three children will learn about:** • Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge • Potential difference measured in volts, battery and bulb ratings, resistance measured in ohms, as the ratio of potential difference (p.d.) to current • Differences in resistance between conducting and insulating components (quantitative). • Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects • The idea of electric field, forces acting across the space between objects not in contact.	**In Key Stage 3, children will learn about:** • the similarities and differences between light waves and waves in matter • light waves travelling through a vacuum; speed of light • the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface Science • 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 • light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras • colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection.	
Big Question and key questions	**How do our choices affect how our bodies work? Why does my heart beat?** • Why do we need oxygen? • How do we breathe? • Do fish and plants breathe? • Do all living things need oxygen? • Are there ways to increase/decrease our lung capacity? • Why do we have blood? • How does our heart work? • How does size of muscle affect our pulse rate? • How does exercise effect our pulse rate? • How might the circulatory system of an elephant, a hummingbird, or a polar bear differ?	**What is evolution, how does it happen and how do scientists know?** • Why are we all different? • How do we change? • What is variation, and why is it important? • How did life begin on Earth? • What is evolution? • What evidence is there for evolution? • How does evolution happen? • What reasons do animals become extinct? • Polar Bears' habitat is rapidly changing, what possible futures do they face, and can we predict which is most likely? • How did Darwin come up with the theory of evolution? • Why was Darwin's theory not initially accepted?	**In what ways can we sort living things?** • Why do we need to classify living things? • How do we classify? • What are the difficulties with classification? (penguins, whales, platypus) • How do animals change over time? • Why does variation exist? • What happens if animals of different species breed? (hybrids) • What happens to house plants outside? • What are micro-organisms? • How can we prevent the spread of disease? • Why do animals and plants compete – and what for?	**(Link to British Science Week 10-19 March 2023 – Connections)** **Can we vary the effects of electricity?** • Do all batteries push as hard as each other? • What is electricity? • How does the voltage of a battery affect how much current is pushed? • How does the length of time I leave the current flowing for affect the brightness of the bulb? • How does number of bulbs affect the brightness of a bulb? • Are all types of wires as good at conducting electricity? • Why are wires insulated in plastic? Does type of material make a difference? • Does length of wire make a difference? • Does the type of circuit affect how the components work/how long the battery lasts? • What renewable ways can we generate electricity? • How does current affect heat? • What are the dangers of a short circuit?	**Why does my shadow change length over the course of a day?** • How does the size of an object affect the size of a shadow? • How does the distance between the light and the object change the size of a shadow? • How does the distance between the object and the size of the screen affect the size of a shadow? • How would a solar eclipse be different if: - The moon was a different size? - The earth span faster or slower? - The sun was larger or smaller? - If the earth and moon where the same size but further away in the solar system? • How does the amount of aluminium foil scrunched affect how much light is scatters? • How does the amount of polishing affect how well a piece of metal scatters light? • How perfect are our mirrors? Do some scatter light more than others? • What happens to light when it is shone through water? How is this affected by putting glitter, salt or talc in the water? • How does a periscope/microscope/telescope work?	

Scientific Vocabulary	oxygenated, deoxygenated, valve, exercise, respiration, circulatory system, heart, lungs, blood vessels, blood, artery, vein, pulmonary, alveoli, capillary, digestive, transport, gas exchange, villi, nutrients, water, oxygen, alcohol, drugs, tobacco.	fossils, adaptation, evolution, characteristics, reproduction, genetics, variation, inherited, environmental, mutation, competition, survival of the fittest, evidence	Variation, organisms, populations, classification, characteristics, environment, flowering, nonflowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation, classify, compare, bacteria, microorganism, organism, invertebrates, vertebrates, Linnaean.	electricity, neutrons, protons, electrons, nucleus, atom, electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery holder, motor, buzzer, switch, conductor, electrical insulator, conductor.	light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent, reflect, absorb, emitted, scattered, refraction	
Concepts and Understanding: Sticky knowledge	• The heart pumps blood around the body. • Oxygen is breathed into the lungs where it is absorbed by the blood. • Muscles need oxygen to release energy from food to do work. (Oxygen is taken into the blood in the lungs; the heart pumps the blood through blood vessels to the muscles; the muscles take oxygen and nutrients from the blood.)	• Life cycles have evolved to help organisms survive to adulthood. • Over time the characteristics that are most suited to the environment become increasingly common. *NB: The following could be duplicated in Year 6 Living things and their habitats.* • Organisms best suited to their environment are more likely to survive long enough to reproduce. Organisms are best adapted to reproduce are more likely to do so. • Organisms reproduce and offspring have similar characteristic patterns. • Variation exists within a population (and between offspring of some plants) • Competition exists for resources and mates	• Variation exists within a population (and between offspring of some plants) *– NB: this Key Idea is duplicated in Year 6 Evolution and Inheritance.* • Organisms best suited to their environment are more likely to survive long enough to reproduce.	• Batteries are a store of energy. This energy pushes electricity round the circuit. When the battery's energy is gone it stops pushing. Voltage measures the 'push.' • The greater the current flowing through a device the harder it works. • Current is how much electricity is flowing round a circuit. • When current flows through wires, heat is released. The greater the current, the more heat is released.	• Animals see light sources when light travels from the source into their eyes. • Animals see objects when light is reflected off that object and enters their eyes. • Light reflects off all objects (unless they are black). Non-shiny surfaces scatter the light, so we do not see the beam. • Light travels in straight lines. • Organisms are best adapted to reproduce are more likely to do so. • Organisms reproduce and offspring have similar characteristic patterns. • Competition exists for resources and mates.	
Plan Bee Working Scientifically skills	• I can plan an experiment, as James Lind, to see whether eating different foods can cure scurvy. • I can suggest ways in which James Lind could have expanded his clinical trial. • I can plan a clinical trial to explore the effects of different foods on our bodies, explaining how I will make it a fair test and what I expect the results to show. • I can allocate a variety of foods to their correct food group. • I can assess a variety of food labels to assess which of a group of foods has e.g. the most and least fat, or the most and least carbohydrate. • I can use a diagram of the human heart to suggest how it works. • I can write a detailed report about how the circulatory system works. • I can dissect a heart to explore the heart's chambers, veins and arteries, writing a recount of my findings. • I can take my own pulse before and after exercise, recording the differences. • I can design an investigation to explore how exercise affects our heart rate and draw conclusions from my results. • I can label muscle groups on a diagram of the human body. • I can suggest some exercise that would train different muscle groups. • I can create a presentation to answer a particular question about drugs, using my own research to find answers.	• I can identify features I have inherited from my parents and note variations. • As a class, we can arrange ourselves in different ways according to our inherited characteristics. • I can carry out my own research to find animals that live in a particular environment around the world, recording the features that make it advantageous for its habitat. • I can compare and contrast the features of two animals living in the same environment, explaining why each of their features are advantageous for that particular species. • I understand that scientists are always refining, changing and developing the ideas of other scientists, and that ideas can be refuted when further evidence is uncovered. • I can ask questions about evolution and use my own research to find the answers, presenting my findings. • I can create a fact file about Charles Darwin, using known facts and my own research. • I can read statements and write persuasive arguments to show whether I agree or disagree, drawing on my knowledge of evolution and inheritance.	• I can classify a variety of organisms into groups according to their features. • I can use a classification key to help me identify which group unfamiliar animals belong to. • I can create a presentation with labelled diagrams to show the features of each group of animals. • I can use a variety of criteria to classify animals that belong to the same group, e.g. mammals. • I can create a classification key to help identify a variety of flowering and nonflowering plants. • I can gather plant samples (or photographs of plants) from the local area, then create a classification key to identify them. • I can find a variety of different ways to classify different plants. • I can use the Linnaeus classification system to identify the kingdom, phylum, class, order, family, genus and species of a variety of organisms. • I can use the Linnaeus classification system to answer questions about different organisms. • I can carry out my own research to create a report about a particular family of animals, including pictures, diagrams and information. • I can ask questions about micro-organisms and use my own research to answer them. • I can carry out a fair test to explore which foods yeast most likes to eat, recording the results and drawing conclusions.	• I can work independently to create a series and a parallel circuit. • I can create series and parallel circuits to match a circuit diagram. • I can use what I know about voltage to predict the brightness of a bulb or bulbs in a variety of different circuits. • I can experiment with the best way to make the bulb in a circuit as bright as possible, recording my results on a scale. • I can draw a circuit diagram that includes conventional circuit symbols. • I can create series and parallel circuits to match a circuit diagram that uses conventional circuit symbols. • I can plan, set up and carry out a fair test to see how changing the wire in a circuit affects the brightness of a bulb. • I can use the results of my experiment to answer questions. • I can ask questions about circuits I would like to find the answer to, and decide how to find the answers. • I can design and create a circuit for a particular purpose.	• I can draw on my previous knowledge of light and shadow to answer a variety of questions. • I can use careful observation to identify the pupil, cornea, iris and sclera of the human eye. • I can use arrows to draw the direction light travels. • I can label a cross-section diagram of the human eye, explaining the function of each part. • I can present information about how the eye works in a variety of different ways. • I can use what I know about the angle of reflection to draw the angle light will reflect off a mirror. • I can use what I know about the angle of reflection to shine a light beam to a goal using mirrors. • I can make predictions about which surfaces will reflect a lot of light and which won't. • I can investigate a variety of surfaces to see which reflect a lot of light and which don't, noting similarities and differences between the two groups. • I can suggest a variety of investigations to explore how shadows behave. I can carry out an investigation to explore what happens to the size and shape of a shadow when an object is moved further away from a light source, recording my results in graphs and tables.	• I can share facts about Stephen Hawking's life and work; • I can set up an enquiry into the effects of black holes; • I can draw a diagram of their observations from an enquiry into black holes; • I can give facts about Libbie Hyman's life and work; • I can describe the characteristics of invertebrates; • I can make the link between saturated fat in our diets and high cholesterol levels. • I can describe Alexander Fleming's discovery of penicillin; • I can construct a scatter graph from a table of results; • I can sort facts about Mary Leakey's life and work; • I can describe the fossils found by Mary Leakey; • I can label the main parts of the heart; • I can answer questions about Steve Jobs' life and work; • I can identify some food sources.

			• I can gather samples of organisms in the local area (or take photos) to identify and classify organisms found in the local area. • I can carry out my own research to find out about different groups of organisms in a different part of the world, presenting my findings appropriately.			
Scientific enquiry ideas	**Comparative tests:** Can exercising regularly affect your lung capacity? Which type of exercise has the greatest effect on our heart rate? **Identify and classify:** Which organs of the body make up the circulation system, and where are they found? **Observation over time:** How does my heart rate change over the day? How much exercise do I do in a week? **Pattern Seeking**: Is there a pattern between what we eat for breakfast and how fast we can run? **Research:** How have our ideas about disease and medicine changed over time? **Fair test:** How does the length of time we exercise affect our heart rate?	**Comparative tests:** What is the most common eye colour in our class? **Identify and classify:** Compare the skeletons of apes, humans, and Neanderthals – how are they similar, and how are they different? Can you classify these observations into evidence for the idea of evolution, and evidence against? **Observation over time:** How has the skeleton of the horse changed over time? **Pattern Seeking:** Is there a pattern between the size and shape of a bird's beak and the food it will eat? **Research:** What happened when Charles Darwin visited the Galapagos islands? What ideas did American geneticist Barbara McClintock have about genes that won her a Nobel Prize?	**Comparative tests:** How does the temperature affect how much gas is produced by yeast? Which is the most common invertebrate on our school playing field? **Identify and classify:** How would you make a classification key for vertebrates/invertebrates or micro-organisms? **Observation over time:** What happens to a piece of bread if you leave it on the windowsill for two weeks? **Pattern Seeking:** Do all flowers have the same number of petals? **Research:** What do different types of microorganisms do? Are they always harmful?	**Comparative tests:** How does the voltage of the batteries in a circuit affect the brightness of the lamp/volume of the buzzer? Which make of battery lasts the longest? Which type of fruit makes the best fruity battery? **Identify and classify:** How would you group electrical components and appliances based on what electricity makes them do? **Observation over time:** How does brightness of bulb change as the battery runs out? How can we measure how quickly a battery is used up? **Pattern Seeking:** Does the temperature of a light bulb go up the longer it is on? **Research:** How has our understanding of electricity changed over time?	**Comparative tests:** How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface? Which material is most reflective? **Identify and classify:** Can you identify all the colours of light that make white light when mixed together? What colours do you get if you mix different colours of light together? **Observation over time:** Does the temperature of a light bulb go up the longer it is on? How does my shadow change over the day? **Pattern Seeking:** Is there a pattern to how bright it is in school over the day? And, if there is a pattern, is it the same in every classroom? **Research:** Why do some people need to wear glasses to see clearly? How do our eyes adapt to different conditions?	**Comparative tests:** **Identify and classify** **Observation over time:** **Pattern Seeking** **Research:**
Cross Curricular Links	**Cultural Capital:** Gather sample/photos of organisms in our school/Corsham **History:** Disease and medicine improvements **Geography:** **English Texts:** Pig-Heart Boy (Malorie Blackman) Skellig (David Almond) A Heart Pumping Adventure (Heather Manley) **Writing Outcome:** Information – reports on particular family of animals.	**Cultural Capital:** **History:** Darwin's expedition on the Beagle **Geography:** Plot Darwin's route around the world **English Texts:** One Smart Fish (Christopher Wormell) The Molliebird (Jules Pottle) Our Family Tree (Lisa Westberg Peters) **Writing Outcome:** Information – reports and explanations.	**Cultural Capital:** Camera trap on school grounds; what animals live in our area? **History:** **Geography:** **English Texts:** Beetle Boy (M G Leonard) Insect Soup (Barry Louis Polisar) Fur and Feathers (Janet Halfmann) The Wonder Garden (Jenny Broom) **Writing Outcome:** Diary from camera trap observations. Record observations.	**Cultural Capital:** **History:** **Geography:** **English Texts**: Goodnight Mr Tom (Michelle Magorian) Blackout (John Rocco) Hitler's Canary (Sandi Toksvig) Energy Island (Allan Drummond) **Writing Outcome:**	**Cultural Capital:** Lacock's Fox Talbot Museum, first photograph taken there. **History:** **Geography:** **English Texts:** Letters from the Lighthouse (Emma Carroll) The King Who Banned the Dark (Emily Haworth-Booth) Shadow (Lucy Christopher) **Writing Outcome:**	**Cultural Capital:** **History:** **Geography:** **English Texts:** **Writing Outcome:**
TAPS assessment tasks	'Invertebrate research (research) 'Outdoor keys' (record) 'Heart rate' (enquiry)	'Evolution fossil habitats' 'Evolution egg strength'		'Bulb brightness' (questioning) 'Conductive dough' (observe/measure)	'Investigating shadows' (record) 'Light questions' (questioning)	
Key Scientists	Justus von Liebig (Theories of Nutrition, Metabolism) Sir Richard Doll (Smoking and Health Problems link) Leonardo Da Vinci (Anatomy) Alexander Fleming (Physician and Microbiologist) Marie Curie (Physicist and Chemist)	Charles Darwin (Naturalist) Jane Goodall (Chimpanzees) Barbara McClintock (Genes) Gregor Mendel (Botanist and Biologist)	Carl Linnaeus (Identifying, Naming and Classifying Organisms) Marjory Stoneman Douglas (Writer and Conservationist)	Alessandro Volta (Electrical Battery) Nicola Tesla (Alternating Currents) Michael Faraday (Physicist) William Kamkwamba (Inventor)	Thomas Young (Wave Theory of Light) Ibn al-Haytham (Alhazen) (Light and our Eyes) Percy Shaw (The Cats Eye) Thomas Edison (Inventor) Edith Clarke (Electrical Engineer)	Stephen Hawking Libbie Hyman Alexander Fleming Mary Leakey Steve Jobs