Randwick C of E Primary School

Curriculum Map: Science.

	Intent: **At Randwick C of E Primary School the teaching of science will stimulate the minds of our learners and develop their curiosity about the world around them through an enquiry-based approach.** The teaching of science should prepare our children to understand their role in the wider world and how to be a responsible global citizen. We believe that giving our children a knowledge-rich science curriculum with a range of opportunities to work scientifically and be active learners will enable them to think like a 'scientist'. At Randwick we utilise our children's experience of science and pursue their interests to enrich our science capital and tailor learning to meet the needs of our pupils.					
Subject	**Term 1**	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Reception	**Reception** **Explore materials with different properties by learning the names of different materials, measuring performance of different materials under different conditions including strength, waterproofness, magnetism, buoyancy** by observation **and finding out how materials can change when mixed with other materials or changed by being bent, stretched, twisted, squashed, heated or cooled.** Explore collections of materials with similar and/or different properties **including identifying differences and sorting them, as well as comparing their suitability for different tasks or for making something** **Explore some light sources and how they need to be blocked to create a shadow, and how a shadow can change size or shape** Use their senses in hands-on exploration of natural materials, **including finding practical uses for them** Describe what they see, hear and feel, smell and taste **and what part of their body they use to do these** **Understanding the World: The Natural World** Explore the natural world around them, making observations and drawing pictures Plant seeds and care for growing plants **including taking very simple measurements, observing changes and comparing different plants** Recognise some environments that are different to one in which they live, **what sort of animals and plants will live there and why, using stories and other experiences** Understand the effect of changing seasons on the natural world around them, **including how plants and some animals, including humans are affected** **Explore natural materials, indoors and outdoors including thinking about where they have come from, what they might be used for and why they are 'natural'** **Early Learning Goals** Explore the natural world around them, making observations and drawing pictures of animals and plants Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class Understand some important processes and changes in the natural world around them, including seasons and changing states of matter					
Vocabulary	**Seasons, weather, waterproof, hot, cold, rain, sun, hail, snow, Autumn, Winter, Spring, Summer, change.** **Habitat, minibeast, alive, dead, rotting, animal, human, mammal, insect, amphibian, fish, senses, life-cycle, growing.** **Materials, soft, hard, transparent, sticky, stretchy, rough, smooth, dry, wet.** **Plant, flower, stem, leaves, roots, petals, grow.** **Solid, liquid, melting, freezing, dissolving.**					

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Subject	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Buzzards Cycle A	**Everyday Materials** *Distinguish between and 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. E.g. waterproof / not waterproof, magnetic and non-magnetic. **Sticky Knowledge:** All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons. Materials can be described by their properties e.g. shiny, stretchy, rough etc. Some materials e.g. plastic can be in different forms with very different properties. The properties of a material determine whether they are suitable for a purpose. **Working Scientifically** *Ask simple questions and recognise that they can be answered in different ways. * Observe closely, using simple equipment ¬ perform simple tests ¬ identify and classify *Gather and record data to help in answering questions. *Use their observations and ideas to suggest answers to questions.	**Uses of everyday materials** *Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. *Find out how shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. **Sticky Knowledge** All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. A material can be suitable for different purposes and an object can be made of different materials. Materials can be changed by physical force (twisting, bending, squashing and stretching). **Working Scientifically** *Identifying, grouping and classifying. *Use observations to suggest answers to questions, noticing similarities, differences and patterns. *Gather and record data to help answer questions, including from secondary sources of information. *Communicate ideas, what they have done and what they have found out in a variety of ways Asking simple questions and recognising that they can be answered in different ways including use of Scientific language. *Use simple equipment to observe closely, including changes over time. *Performing simple comparative tests.	**Animals including humans:** *Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. *Identify and name a variety of common animals that are carnivores, herbivores and omnivores. *Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) **Sticky Knowledge** Animals vary in many ways having different structures e.g. wings, tails, ears etc. They also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them. Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals. **Working scientifically** *Identifying, sorting and classifying. *Use their observations and ideas to suggest answers to questions. *Asking simple questions and recognising that they can be answered in different ways	**Plants** *Identify and name a variety of common wild and garden trees, including deciduous and evergreen trees. *Identify and describe the basic structure of a variety of trees. *Identify and name the roots, trunk, branches and leaves of trees *Observe and describe how seeds grow into mature plants. *Find out and describe how plants need light and suitable temperature to grow and stay healthy. **Sticky Knowledge** Growing locally, there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants. Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring. Plants grow from seeds. Plants need light, water and warmth to grow and survive. Flowers make seeds to make more plants (reproduce). We need plants to survive (to clean air, to eat). We can eat different parts of the plants (leaves, stems, roots, seeds, fruit). **Working Scientifically** *Ask simple questions and recognise that they can be answered in different ways. * Observe closely, using simple equipment ¬ perform simple tests ¬ identify and classify *Gather and record data to help in answering questions. *Use their observations and ideas to suggest answers to questions.	**Living things in their habitats** *Explore and compare the differences between things that are living, dead, and things that have never been alive. including learning MRSGREN, the characteristics that all living things must have to be considered living, and that some things (eg crystals) may have some of these characteristics but not all so 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. Desert and ocean. Local habitats ponds. *identify and name a variety of plants and animals in their habitats, including microhabitats. Under logs. *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. **Sticky Knowledge** All objects are either living, dead or have never been alive. Living things are plants (including seeds) and animals. Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers. An object made of wood is classed as dead. Objects made of rock, metal and plastic have never been alive (again ignoring that plastics are made of fossil fuels). Animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants - shelter, food and water. Within a habitat there are different micro-habitats e.g. in a pond- under logs. These micro-habitats have different conditions e.g. light or dark, damp or dry. These conditions affect which plants and animals live there. The plants and animals in a habitat depend on each other for food and shelter etc. The way that animals obtain their food from plants and other animals can be shown in a food chain. **Working Scientifically** *Ask simple questions and recognise that they can be answered in different ways. * Observe closely, using simple equipment ¬ perform simple tests ¬ identify and classify *Gather and record data to help in answering questions. *Use their observations and ideas to suggest answers to questions.	
Vocabulary	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, magnetic, non-magnetic, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through	Opaque, transparent, translucent, reflective, non-reflective, flexible, rigid, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching, raw and synthetic materials.	fish, amphibians, reptiles, birds, mammals, scales, feathers, fur, hair, eggs, live young, claws, biped/bipedal, fins, carnivores, meat, sharks, killer whales, tigers, lions, cats, dogs, foxes, herbivores, plants, rodents, giraffes, rabbits, horses, cows, insects, omnivores, meat and plants, humans, badgers, bears, chickens	Leaves, trunk, branch, root, fruit, blossom, bud seed, bulb, wild, garden, deciduous, evergreen, oak, beech, maple, birch, sycamore, ash, fir, aspen observe, grow, compare, record, temperature, predict, measure, diagram, germinate, warmth, sunlight, germinate.	Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, water, air, survive, survival, names of local habitats (e.g. pond, woodland etc.), names of micro-habitats (e.g. under logs, in bushes etc.), conditions, light, dark, shady, sunny, wet, damp, dry, hot, cold, names of living things in the habitats and micro-habitats studied *light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling (Y2 - Plants)* *offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/chicken, cat/kitten, caterpillar/butterfly) (Y2 - Animals, including humans)*	

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TAPs Assessment	TAPS – Waterproof Materials	TAPS – Boat Materials	TAPS- Animal Classify	TAPS – Plant Growth	TAPS – Sorting Living and non-living.	TAPS – Woodlice habitat
	Enquiry Focus: Ask simple questions and recognise that they can be answered in different ways **Concept Context:** Use knowledge and understanding of properties of materials to compare suitability for different uses. **Assessment Focus:** Can children discuss/use different ways to test how waterproof materials are? Can children compare the tests of waterproofness? **End points:** **Not yet met:** Describes their idea/test but it may not help to answer the question and does not consider alternative methods. **Meeting:** Explains different tests, *e.g. you can find out which is waterproof by --- or ---* **Possible ways of going further:** Comments on the best way to find out and understands that a comparison has to be fair, *e.g. I need to add the same amount of water*.	**Enquiry Focus:** Describe what they have found out and use their results to make comparisons **Concept Context:** Properties of materials relating to their uses. **Assessment Focus:** Can the children describe what they have found out about the materials/design? Can the children use their observations and scientific ideas to compare the boat materials? **End points:** **Not yet met:** Can say whether boat worked or not but does not discuss any features of materials or design to explain why. **Meeting:** Uses results to explain why some materials would be better than others for making a boat, in terms of their properties e.g. *the foil was good because it was waterproof and strong, paper is bad because it rips when it gets wet, the plastic bag floated for a long time*. **Possible ways of going further:** Uses results to support explanations (e.g. how many marbles each boat held). Considers how some materials are good in certain circumstances e.g. *the card is good for a little while but it will get soggy later, the foil makes a good boat shape but the hole in the corner made it sink, when we blew up the bag it was really good but the marbles just rolled off so it needs some edges*.	**Enquiry Focus:** Identify and Classify **Concept Context:** Identify and name common animals including fish, amphibians, reptiles, birds and mammals. Identify and name common animals that are carnivores, herbivores and omnivores **Assessment Focus:** Can the children name a variety of animals including fish/amphibians/reptiles/birds/mammals? Can the children classify animals according to different animal groups and/or what they eat? **End points** **Not yet met:** Names some common animals. Needs support to sort or limited to common mammals, birds and fish. **Meeting:** Name a variety of common animals including fish /amphibians /reptiles / birds/mammals. Uses observations to classify into given scientific groupings including animal groups or omnivore/herbivore/carnivore and can explain how they are similar, *e.g. birds have feathers, frogs go in the*	**Enquiry focus:** Observe closely, using simple equipment. **Concept Context:** Describe how plants needs water, light and a suitable temperature to grow and stay healthy. **Assessment Focus:** Can children observe closely, noticing differences and similarities? Can children measure and compare the height of plants? **End Points** **Not yet met:** Describes observable differences at the time of asking e.g. which plant is the tallest and shortest. **Meeting:** Observes and records the appearance of the plants over time (drawing or annotated photo). Can compare the height and/or features of the plants over time e.g. *this one was fine to start with but now it's much smaller*. **Possible ways of going further:** Make a range of comparisons between the plants in different conditions, e.g. colour, droopiness, height, number of leaves.	**Enquiry focus:** (using their observations and ideas to suggest answers to questions) **Concept Context:** Explore and compare the differences between things that are living, dead, and things that have never been alive. **End points:** **Not yet met:** Children can sort items with adult support but are unsure when working independently, or they have not yet developed/able to express their ideas about living/non-living. **Meeting:** Children meeting the objective would be able to explain why they had sorted in this way e.g. *"because it moves on its legs and it would probably go and get something to eat and drink if it was hungry", "it's living because it can be pregnant and it can get a husband or wife", "the rock doesn't grow, eat, move or have babies"*. **Possible ways of going further:** Children explore ideas further e.g. *the seeds can't grow at the moment, but they will if you give them a drink* (seeds can be dormant).	**Enquiry Focus:** Gather and record data to help in answering questions. **Concept Context:** 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.TAP **Assessment Focus:** Can children gather and record data in a tally chart or on a map? Can children discuss their findings in relation to preferred habitats? **End points:** **Not yet met:** Says how many woodlice were found, *e.g. I found 3 woodlice*. Needs support to record on a tally chart or map. **Meeting:** Can draw a tally chart (after it's been modelled to them) or record on a map and explain why woodlice are found in a particular habitat, *e.g. I found 3 here and 3 there because it is dark*. **Possible ways of going further** Can independently explain their tally chart / map, *e.g. There are more spiders here and more woodlice there…* Explaining why the woodlice might live there e.g. because of predators.

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Subject	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Buzzards Cycle B ***Plant daffodil bulbs**	**Animals including humans** Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. *Notice that animals, including humans, have offspring which grow into adults. *Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) *Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. **Sticky Knowledge** Humans have key parts in common, but these vary from person to person. Humans (and other animals) find out about the world using their senses. Humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles. All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive. To grow into healthy adults, they also need the right amounts and types of food and exercise. Good hygiene is also important in preventing infections and illnesses. Animals move in order to survive. Different animals move in different ways to help them survive. Exercise keeps animal's bodies in good condition and increases survival chances. All animals eventually die. Animals reproduce new animals when they reach maturity. Animals grow until maturity and then do not grow any larger. **Working scientifically** *Identifying, grouping and classifying. *Use observations to suggest answers to questions, noticing similarities, differences and patterns. *Gather and record data to help answer questions, including from secondary sources of information. *Communicate ideas, what they have done and what they have found out in a variety of ways Asking simple questions and recognising that they can be answered in different ways including use of Scientific language. *Use simple equipment to observe closely, including changes over time		**Everyday Materials** *Distinguish between and 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. E.g. transparency, reflectiveness **Sticky Knowledge** All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons. Materials can be described by their properties e.g. shiny, stretchy, rough etc. Some materials e.g. plastic can be in different forms with very different properties. The properties of a material determine whether they are suitable for a purpose. **Working Scientifically** *Ask simple questions and recognise that they can be answered in different ways. * Observe closely, using simple equipment ¬ perform simple tests ¬ identify and classify *Gather and record data to help in answering questions. *Use their observations and ideas to suggest answers to questions	**Plants** *Identify and name a variety of common wild and garden plants. *Identify and describe the basic structure of a variety of common flowering plants (flowers). *Observe and describe how bulbs grow into mature plants. *Find out and describe how plants need water to grow and stay healthy. **Working Scientifically** *Ask simple questions and recognise that they can be answered in different ways. * Observe closely, using simple equipment ¬ perform simple tests ¬ identify and classify *Gather and record data to help in answering questions. *Use their observations and ideas to suggest answers to questions.	**Living things in their habitats** *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. Rainforest and Arctic regions. Local habitats woodlands. *identify and name a variety of plants and animals in their habitats, including microhabitats. In bushes. *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. **Sticky Knowledge** Animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants – shelter, food and water. Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter, on the bark of trees, on the leaves. These micro-habitats have different conditions e.g. light or dark, damp or dry. These conditions affect which plants and animals live there. The plants and animals in a habitat depend on each other for food and shelter etc. The way that animals obtain their food from plants and other animals can be shown in a food chain. **Working Scientifically** *Ask simple questions and recognise that they can be answered in different ways. * Observe closely, using simple equipment ¬ perform simple tests ¬ identify and classify *Gather and record data to help in answering questions. *Use their observations and ideas to suggest answers to questions.	
Vocabulary	Parts of the human body including those within the school's RSE policy, senses, touch, see, smell, taste, hear, fingers, skin, eyes, nose, ears, tongue. offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/chicken, kitten/cat, caterpillar/butterfly), survive, survival, water, food, air, exercise, heartbeat, breathing, hygiene, germs, disease, food types (e.g. meat, fish, vegetables, bread, rice, pasta, dairy) *living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, water, air, survive, survival (Y2 - Living things and their habitats)*		Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, absorbent, breaks/tears, rough, smooth, shiny, dull, transparency, opaque, reflectiveness	Common plants, wild plants, leaf, leaves, roots, bud, flowers, blossom, petals, daisy, daffodil, buttercup, rose, lily, lavender, stem, bulb, seed, water, light, suitable temperature.	Suited, suitable, basic needs, food, food chain, shelter, move, feed, water, air, survive, survival, names of local habitats (e.g. woodland etc.), names of micro-habitats (e.g. under logs, in bushes etc.), conditions, light, dark, shady, sunny, wet, damp, dry, hot, cold, names of living things in the habitats and micro-habitats studied *light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling (Y2 - Plants)* *offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/chicken, cat/kitten, caterpillar/butterfly) (Y2 - Animals, including humans)*	

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Assessment	TAPS- Comparing Hand span	TAPS - Body parts	TAPS - Waterproof Materials	TAPS - Plant Structure	TAPS - Feeding Simulation	TAPS - Nature Spotters.
	Enquiry Focus: Using their observations and ideas to suggest answers to questions. **Concept Context:** Recognise growth in humans. **Assessment Focus:** Can children use their observations to compare different hand spans? Can children use their observations to suggest answers to their questions about hand spans? **End Points** **Not yet met:** Can make simple comparisons, saying which hand is smallest or biggest. **Meeting:** Can make comparisons using their observations/results to say which hands are bigger and smaller. Suggests reasons for differences in results *e.g. his hand is bigger because he has had longer to grow, she holds more cubes because she spreads out her fingers far to grab them.* **Possible ways of going further:** Can make predictions relating hand span to height, *e.g. a Year 6 will have bigger hands / will hold more cubes because....* Can raise further questions related to height that could be tested, *e.g. when do your hands stop growing?*	**Enquiry focus:** Use observations and ideas to suggest answers to questions. **Concept Context:** Identify basic parts of the human body and say which part of the body is associated with each sense. **Assessment Focus:** Can the children observe and name parts of the human body? Can the children use their observations to say which part of the body is associated with each sense? **End Points** **Not yet met:** When prompted can name some body parts but does not suggest what these parts might do. **Meeting:** Can name a range of body parts. Can link body parts to senses, *e.g. I can smell things with my nose.* **Possible ways of going further:** Can talk about differences and similarities of body parts. Can name some internal organs, *e.g. heart, brain, lungs, stomach.*	**Enquiry Focus:** Recognise that sorting questions can be answered in different ways. **Concept Context:** Describe properties of materials **Assessment Focus:** Can children test whether materials are opaque or transparent? Can children compare materials on the basis of their transparency? Can children discuss different ways to test transparency? **End points:** **Not yet met:** Can sort materials into two groups but not clear or gives a reason for the sorting that doesn't link to transparency. May not use a single criterion to sort: "these are colourful, these are shiny". May confuse transparency with other properties e.g. reflection or bright colours. **Meeting:** Describe how they sorted the materials according to how transparent they are, and how other groups used different ways to sort the materials. **Possible ways of going further:** Able to order the materials from most to least transparent and explain how the test helped them decide on this sequence. Can comment on effectiveness of different ways to test or compare the objects	**Enquiry Focus:** Observe closely using simple equipment. **Concept Context:** Identify and describe the basic structure of a tree. **Assessment Focus:** Can children make careful observations of similarities and differences between plants? Can children label the basic parts of a plant? **End points:** **Not yet met:** Describe what they can see using everyday language. With support, label the basic structure of a plant. **Meeting:** Can describe and point to the basic structure of a plant and a tree using scientific language, *e.g. leaves, flowers, petals, fruit, roots, bulb, seed, trunk, branch, stem.* May begin to explain what the parts of the plant are for. **Possible ways of going further:** Can use their observations to make comparisons between different plants or between different plant parts, *e.g. that plant has a thicker/taller stem than that one, the petals are smaller than the leaves.*	**Enquiry Focus:** Perform simple tests, observe closely. **Concept Context:** Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. **Assessment Focus:** Can children carry out a simple test to simulate feeding? Can children observe closely to collect data? **End points:** **Not yet met:** Children have difficulty performing the test, e.g. trouble sorting or counting the 'food'. **Meeting:** Children meeting the objective would be able to follow instructions to carry out the simulation and observe closely to sort the 'food'. **Possible ways of going further:** Children may consider the implications of repeatedly feeding in a plastic-rich environment. They may consider other implications e.g. plastic around feet/wings etc. They may go on to do their own research about the main plastic pollutants in the ocean.	**Enquiry focus:** Identifying and classifying **Concept Context:** Identify and name a variety of plants and animals in their habitats, including micro-habitats. **Assessment Focus** Can children use spotter sheets to identify plants/animals? Can children classify the types of plants/animals they have found? **End Points:** **Not yet met:** Children may name animals already known to them e.g. ants and spiders with little reference to the spotter sheets. Children will not yet be linking the specific animal to its features e.g. *I know it's an ant because we have them in my garden.* **Meeting:** Children use spotter sheets to identify plants or animals e.g. *I think that is an earwig because it has a funny tail like on the sheet.* Children begin to classify e.g. *That woodlouse can't be an insect because it doesn't have 6 legs. The squirrel in the tree is all furry so it must be a mammal.* **Possible ways of going further:** Children can discuss the limitations of the spotter sheets e.g. *I think it is a kind of ladybird because it has the same kind of back and legs, but it is not the same as on the sheet, but the sheet can't have pictures of all the ladybirds.*

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Subject	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Kestrels Cycle A	**Sound:** *Identify how sounds are made, associating some of them with something vibrating. *Recognise that vibrations from sounds travel through a medium to the ear *Find patterns between the pitch of a sound and features of the object that produced it *Find patterns between the volume of a sound and the strength of the vibrations that produced it. *Recognise that sounds get fainter as the distance from the sound source increases. **Sticky Knowledge** *A sound produces vibrations which travel through a medium from the source to our ears. *Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter.) * The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound. *Sound travels from its source in all directions and 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 produce louder sounds and smaller vibrations produce quieter sounds. * Faster vibrations (higher frequencies) produce higher pitched sound. *A sound insulator is a material which blocks sound effectively. **Working scientifically** *Ask relevant questions and use different types of scientific enquiries to answer them. *Set up simple practical enquiries, comparative and fair tests. *Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers *Gather, record, classify and present data in a variety of ways to help in answering questions. *Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables *Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. *Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions *Identify differences, similarities or changes related to simple scientific ideas and processes. *Use straightforward scientific evidence to answer questions or to support their findings.	**Animals including humans** *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. **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. **Working scientifically** *Ask relevant questions, use different types of scientific enquiries to answer them. *Gather, record, classify and present data in a variety of ways to help in answering questions *Identify differences, similarities or changes related to simple scientific ideas and processes. *Use straightforward scientific evidence to answer questions or to support their findings. *Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	**States of Matter** *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. **Sticky Knowledge** *Solids, liquids and gases are described by observable properties. *Materials can be divided into solids, liquids and gases. -A solid keeps its shape and has a fixed volume. -A liquid has a fixed volume but changes in shape to fit the container. - A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. -Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid. *Heating causes solids to melt into liquids and liquids evaporate into gases. d) 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. - Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. -The freezing point of water is 0oC. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100oC. -Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy. -Condensation is the change back from a gas to a liquid caused by cooling. -Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle. **Working scientifically** *Ask relevant questions, use different types of scientific enquiries to answer them. *Gather, record, classify and present data in a variety of ways to help in answering questions. *Set up simple practical enquiries, comparative and fair tests. *Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. *Identify differences, similarities or changes related to simple scientific ideas and processes. *Use straightforward scientific evidence to answer questions or to support their findings. *Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. *Use results to draw simple conclusions, make predictions for new values.	**Living things and their habitats.** *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. **Sticky Knowledge** *Living things can be divided into groups (classified) based upon their characteristics/ features. - Classification keys can be used to identify and name living things. *Environmental change affects different habitats differently. -E.g. through flooding, fire, earthquakes etc. *Different organisms are affected differently by environmental change. *Different food chains occur in different habitats. *Human activity significantly affects the environment – This can be in a good way (i.e positive human impact, such as setting up nature reserves) or in a bad way (i.e negative impact, such as littering). **Working scientifically** *Ask relevant questions and use different types of scientific enquiries to answer them. *Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers *Gather, record, classify and present data in a variety of ways to help in answering questions. *Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. *Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. *Identify differences, similarities or changes related to simple scientific ideas and processes. *Use straightforward scientific evidence to answer questions or to support their findings.	**Electricity** *Identify common appliances that run on electricity. *Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. *Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. *Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. *Recognise some common conductors and insulators, and associate metals with being good conductors. **Sticky Knowledge** * Many household devices and appliances run on electricity. *A source of electricity (mains of battery) is needed for electrical devices to work. *An electrical circuit consists of a cell or battery connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit, the component will not work. A switch can be added to the circuit to turn the component on and off. *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. - Metals are good conductors so they can be used as wires in a circuit. *Materials that don't allow electricity to flow easily are called insulators. -Non-metallic solids are insulators except for graphite (pencil lead). - Water, if not completely pure, also conducts electricity. **Working scientifically** *Ask relevant questions and use different types of scientific enquiries to answer them. * Set up simple practical enquiries, comparative and fair tests. *Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. *Reporting on finding from enquires, including oral and written, displays or presentations of results and conclusions. *Identifying differences, similarities or changes related to simple scientific ideas and processes. *Use straightforward scientific evidence to answer questions or to support their findings. *Use results to draw simple conclusions, make predictions for new values.

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Vocabulary	Amplitude, volume, quiet, loud, ear, pitch (high/ low), high, low, particles, instruments, wave, vibrate, vibration, vibrating, insulation, travel, faint, medium, sound, source.	Herbivore, Carnivore, Digestive system, digestion, tongue, mouth, teeth, saliva, oesophagus, stomach, gall bladder, small intestine, pancreas, large intestine, rectum, anus, liver, tooth, canine, incisor, molar, premolar, producer, consumer, predator, prey.	Particles, changing state, solid, liquid, gas, heating, cooling, ice, freeze, state change, melting, freezing, melting point, boiling, boiling point, degrees Celsius evaporation, condensation, temperature, water cycle, water vapour, thermometer, precipitation, materials, properties, matter, melt, process, energy.		Vertebrate, invertebrate, mammal, fish, amphibians, reptiles, bird, arthropod, insect, arachnid, crustacean, mollusc, classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate, flowering, nonflowering, plants, animals, human impact, nature reserves, deforestation, habitat.	Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol, appliances N.B. Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6. .
	TAPS- Investigating Pitch **Enquiry Focus:** Ask relevant questions and use different types of scientific enquiries to answer them. **Concept Context:** Find patterns between the pitch of a sound and features of the object that produced it. Assessment Focus: Can children suggest how to alter the pitch? Can children carry out simple tests of these ideas? **End Points** **Not yet met:** Can ask questions, e.g. *which makes the highest sound?* Makes some suggestions about what to do, but needs help in phrasing the question. **Meeting:** Can ask questions and turn them into a form that can be investigated. E.g. *How does the size of the drum affect the pitch?* **Possible ways of going further:** Can use their results to make a prediction to set up further comparative fair tests, e.g. *I know that a small drum makes a high pitch so will a small recorder make a higher pitch than a long one?*	**TAPS- Teeth (Eggs) in Liquid** **Enquiry Focus:** Use results to draw simple conclusions. **Concept Context:** Function of teeth – to find out about what damages teeth and how to look after them. **End Points** **Not yet met:** Describes differences, e.g. *the egg is OK in milk/water but not in coke*. **Meeting:** Can order liquids according to damage done to eggs and suggest reasons why. Able to raise further questions, *e.g. I thought sports drink/orange juice was a 'healthy' drink but it was not, I wonder whether these drinks contain a lot of sugar?* **Possible ways of going further:** Would be able to think about other liquids or factors including acid and carbonated drinks and suggest causal relationships, *e.g. the more acid/sugar in the drink, the worse the damage*. Can recognise problems with the test, e.g. *use of eggs not teeth, eggs were in liquid for 1 week but I do not keep coke in my mouth for 1 week*	**TAPS- Measuring Temperature** **Enquiry Focus:** Take accurate measurements using standard units, using a range of equipment including thermometers and data loggers. **Concept Context:** Understand temperature of materials can be measured in °C. Assessment Focus: Can children use a thermometer to measure temperature accurately? **End Points** **Not yet met:** Recognise there are different ways to measure temperature. Takes measurements, but may need support to read scale. May not be consistent in their readings, e.g. need to be reminded to keep thermometer in water. **Meeting:** Make reasonably accurate measurements of temperature independently using correct units of measurement. **Possible ways of going further:** Can explain advantages and disadvantages of different measuring equipment, e.g. inaccuracy of forehead thermometer. Suggests other factors affecting readings (where held) and ways to improve measurements (repeat readings).	**TAPS – Drying Materials** **Enquiry Focus:** Set up a fair test. **Concept Context:** Rate of evaporation. Assessment Focus: Can children identify what is to be changed and what is to be kept the same? Can children identify what to observe/measure to see if there is a difference? **End Points** **Not yet met:** Can make suggestions about how to answer the question but needs support to explain which variables must be kept the same. **Meeting:** Can set up and carry out a fair test. Is able to say what is changed and that other factors which could affect evaporation are kept the same, e.g. *I will keep the same…amount of water, size of material*. **Possible ways of going further:** Recognises additional variables and could suggest some controls, e.g. *have a dry towel outside to check it doesn't rain, put under gazebo so if it rains it doesn't get more wet*.	**TAPS – Local Environment Survey** **Enquiry focus:** Gather, record and classify data. Concept Context Recognise that living things can be grouped in a variety of ways. Assessment Focus: Can children group living things in different ways? **End Points** **Not yet met:** Children can identify various living creatures by obvious differences and begin to suggest methods of grouping them. **Meeting:** Children identify that animals and plants can be classified in a number of possible ways including vertebrates and invertebrates, flowering and non-flowering plants. **Possible ways of going further:** All groups are sorted by the same characteristic and some groups may be sub-divided. Connections are made between types of living creatures and plants found in each group, e.g. *most insects live in a dark place under rocks or logs*.	**TAPS – Does it conduct electricity?** **Enquiry Focus:** Report on findings from enquires, including oral and written explanations, displays or presentations of results and conclusions. **Concept Context:** Recognise some common conductors and insulators, and associate metals with being good conductors. Construct a simple series electrical circuit. Assessment Focus: Can children explain results and their conclusions? Can children recognise common conductors and insulators? **End points** **Not yet met:** Can identify some (not all) objects that allow/do not allow electricity to pass through them but does not yet make generalisations. **Meeting:** Can describe the circuit and explain how their results (orally/written form) show that metals conduct electricity and most other materials do not. **Possible ways of going further:** Can also suggest other items to fit into the pattern and explore exceptions to the rule. Can apply the terms conduct/insulate to explain safety rules, e.g. not putting knife in toaster.

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Subject	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Kestrels Cycle B	**Animals including humans** * Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. *Identify that humans and some other animals have skeletons and muscles for support, protection and movement. **Sticky Knowledge** *Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. *Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. *A piece of food will often provide a range of nutrients. *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. **Working scientifically** *Gather, record, classify and present data in a variety of ways to help answer questions. *Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables.	**Forces and Magnets** *Compare how things move on different surfaces. *Notice that some forces need contact between two objects, but magnetic forces can act at a distance. *Observe how magnets attract or repel each other and attract some materials and not others. *Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. *Describe magnets as having two poles. *Predict whether two magnets will attract or repel each other, depending on which poles are facing. **Sticky Knowledge** *A force is a push or a pull. *When an object moves on a surface, the texture of the surface and the object affect how it moves. *A magnet attracts magnetic material. -Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. *The strongest parts of a magnet are the poles. -Magnets have two poles – a north pole and a south pole. If two like poles, e.g. two north poles, are brought together they will push away from each other – repel. -If two unlike poles, e.g. a north and south, are brought together they will pull together – attract. *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. **Working scientifically** *Asking simple questions and recognising that they can be answered in different ways including use of Scientific language. *Use simple equipment to observe closely. *Performing simple comparative tests. *Identifying, grouping and classifying *Gather and record data to help answer questions. *Use observations to suggest answers to questions, noticing similarities, differences and patterns. *Communicate ideas, what they have done and what they have found out in a variety of ways.	**Light** *Recognise that they need light in order to see things and that dark is the absence of light. *Notice that light is reflected from surfaces. *Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. *Recognise that shadows are formed when the light from a light source is blocked by an opaque object. *Find patterns in the way that the size of shadows changes. **Sticky Knowledge** *We see objects because our eyes can sense light. *There must be light for us to see. *Without light it is dark. Dark is the absence of light. *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. For example, the sun, light bulbs and candles. *The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light. *Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. *The size of the shadow depends on the position of the source, object and surface. **Working scientifically** *Asking simple questions and recognising that they can be answered in different ways including use of Scientific language. *Use simple equipment to observe closely. *Performing simple comparative tests. *Identifying, grouping and classifying *Gather and record data to help answer questions. *Use observations to suggest answers to questions, noticing similarities, differences and patterns. *Communicate ideas, what they have done and what they have found out in a variety of ways.	**Plants** *Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. *Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. *Investigate the way in which water is transported within plants. *Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **Sticky Knowledge** *Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. -The roots absorb water and nutrients from the soil and anchor the plant in place. -The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. -The leaves absorb sunlight and carbon dioxide. ~*Plants are producers; they make their own food. *Flowering plants have specific adaptations which help it to carry out pollination, fertilisation and seed production. *Seed dispersal improves a plants chances of successful reproduction. *Seeds contain enough food for the plant's initial growth. *Some plants produce flowers which enable the plant to reproduce. *Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. *Different plants require different conditions for germination and growth. **Working scientifically** ~*Gather, record, classify and present data in a variety of ways to help answer question. * Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. *reporting on finding from enquires, including oral and written, displays or presentations of results and conclusions. *Identifying differences, similarities or changes related to simple scientific ideas and processes.		**Rocks, Soils and Fossils** *Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter. **Sticky Knowledge** *Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil. *Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water. **Working Scientifically** *Asking simple questions and recognising that they can be answered in different ways including use of Scientific language. *Use simple equipment to observe closely. *Performing simple comparative tests. *Identifying, grouping and classifying. *Gather and record data to help answer questions. *Use observations to suggest answers to questions, noticing similarities, differences and patterns. *Communicate ideas, what they have done and what they have found out in a variety of ways. *Research a famous Scientist (Mary Anning)

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Vocabulary	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine, endoskeleton, exoskeleton, hydrostatic skeleton, vertebrates, invertebrates, contract, relax	Force, push, pull, friction, surface, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole	Light, light source, Sun, sunlight, dangerous, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent.	photosynthesis, pollen, insect/wind pollination, male, female, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport, light, water, support, anchor, reproduction, transportation, flower, energy, growth, seedling, carbon dioxide, oxygen, sugar, material, photosynthesis, chlorophyll		Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, fossil, bone, flesh, minerals, marble, chalk, granite, sandstone, slate, soil, types of soil (e.g. peaty, sandy, chalk, clay)
	TAPS - Investigating skeletons **Enquiry Focus:** use different types of scientific enquiries to answer questions: secondary sources. **Conceptual Context** Identify that humans have skeletons for support, protection and movement. **Assessment Focus** Can children make a series of careful observations? Can children demonstrate an improved understanding through careful observations? **End Points** **Not yet met:** Makes drawings based on current understanding with limited attention paid to observations made from scientific sources. **Meeting:** Makes careful drawings with attention paid to observations made from scientific sources. Will reflect and compare drawings made with scientific sources and offer improvements. **Possible ways of going further:** Considers scientific implications of research and others predictions and hypotheses linked to the concept *e.g. what would be the impact of a human not having a skeleton? What variations may occur within human skeletons?*	**TAPS- Cars down ramps** **Enquiry Focus:** Gather, record and present data (in a table or bar chart) to help in answering questions. **Concept Context** Compare how things move on different surfaces **Assessment Focus** Can children make an accurate record of their measurements? Can children use their results to explain how the car moves on different surfaces? **End Points** **Not yet met:** Measures distance with the equipment provided, recording with support. Predictions/explanations describe how things move (in isolation) e.g. *the car goes fast on plastic*. **Meeting:** Takes and records accurate measurements using standard units and presents findings in a table (or bar chart). Can compare how things move, e.g. *it goes quicker on wood and slower on grass*. **Possible ways of going further:** Systematically takes repeat readings and records all measurements in a table or bar chart. Can explain findings in terms of friction or describe general patterns e.g. *it will go further on a smoother surface because bumps slow it down.*	**TAPS - Can everything make a shadow?** **Enquiry Focus:** Gather and record data to answer questions. **Concept Context** Recognise that shadows are formed when the light from a light source is blocked by an opaque subject. **Assessment Focus** Can children make a series of careful observations? Can children record their observations in a systematic way that relates to the question? **End Points** **Not yet met:** Can use their observations to decide whether or not a shadow has been formed by the material, *e.g. has sorted materials into two piles or recorded tick/cross.* **Meeting:** Can make observations and decide how to record them to answer the question, *e.g. independently records best to worst shadow*. **Possible ways of going further:** Recording communicates clearly how it answers the question, using appropriate vocabulary such as opaque, translucent and transparent.	**TAPS- Function of a plant** **Enquiry Focus:** Use straightforward scientific evidence to answer questions or to support their findings. **Concept Context** Investigate the way in which water is transported within plants. **Assessment Focus** Can children make careful observations? Can children use observations to suggest how water is transported? **End Points** **Not yet met:** Can draw/say what has happened simply, e.g. *the colour went up*. **Meeting:** Observes what has happened and can make suggestions, e.g. *I know there are tubes in the stem, the water goes up the stem and it might go up to the leaves if I leave it for longer*. **Possible ways of going further:** Children can predict what they would expect to happen if the stem was split and each section placed in two different dyes. They raise further questions about how water transportation can be shown in other types of plants *e.g. If we split the celery between two food dyes, I think half the stem will be blue and half will be red because the water from each container will be transported up the stem. I wonder if we could make a white flower change colour?*	**TAPS- Measuring a plant's water intake** **Enquiry Focus:** Making systematic and careful observations and measurements using standard units. **Concept Context** Explore the requirement of plants for life and growth, and how they vary from plant to plant. **Assessment Focus** Can children use simple apparatus to measure water/height? Can children record their measurements? **End Points** **Not yet met:** With support, can measure a volume of water and height of the plant (to nearest cm). **Meeting:** Can measure accurately the volume of water (to nearest 10 ml) and height of a plant (to nearest half cm). **Possible ways of going further:** Measures accurately volume of water given to plants, and heights (mm). Explain importance of and suggests ways to improve accuracy (repeat readings).	**TAPS - Reporting on rocks** **Enquiry Focus:** Reporting on findings from enquiries. **Concept Context** Compare and group together different kinds of rocks on the basis of their properties. **Assessment Focus** Can children group rocks based on properties? Can children talk about / draw a diagram / write about their findings? Can children draw conclusions about the least / most wearing rock? **End Points** **Not yet met:** Says which rock is 'best' but does not give reasons for this conclusion or use their results to make comparisons between the rocks. **Meeting:** Uses their results to order the rocks and can say (orally or with diagrams/writing) which rock is strongest/harder wearing. **Possible ways of going further:** Recommendations are clearly drawn from results and are presented appropriately for the audience. The report contains an explanation of how trustworthy the data is and explains that other factors may need to be tested, *e.g. marble is strong but may be slippery if it gets wet*.

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Subject	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Sparrow hawks **Cycle A**	**Electricity** *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. **Sticky Knowledge** *Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. If you use a battery with a higher voltage, the same thing happens. Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well. *You can use recognised circuit symbols to draw simple circuit diagrams. *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 **Working scientifically** *Identify scientific evidence that has been used to support or refute ideas or arguments. *Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. *Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate *Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. *Use test results to make predictions to set up further comparative and fair tests Report and present findings from enquires, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations (analysing results, anomalies, data etc).	Living things in their habitats *Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. *Give reasons for classifying plants and animals based on specific characteristics. **Sticky Knowledge** *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. *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 *Living things can be formally grouped according to characteristics. Plants and animals are two main groups but there are other livings things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms. *Plants can make their own food whereas animals cannot. Animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates). -Vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals. -Each group has common characteristics. -Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms. *Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants. **Working Scientifically** *Identify scientific evidence that has been used to support or refute ideas or arguments. *Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	Light *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. **Sticky Knowledge** * Light appears to travel in straight lines, and we see objects when light from them goes into our eyes. *The light may come directly from light sources, but for other objects some light must be reflected from the object into our eyes for the object to be seen. *Objects that block light (are not fully transparent) will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object. *Animals see light sources when light travels from the source into their eyes. * Light reflects off all objects (unless they are black). Non shiny surfaces scatter the light, so we do not see the beam. **Working Scientifically** *Identify scientific evidence that has been used to support or refute ideas or arguments. *Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. *Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate *Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. *Use test results to make predictions to set up further comparative and fair tests Report and present findings from enquires, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations (analysing results, anomalies, data etc)	Animals including humans *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. **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. *The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. *Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well out heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g. lack of vitamins. **Working Scientifically** *Identify scientific evidence that has been used to support or refute ideas or arguments. *Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. *Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. *Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. *Use test results to make predictions to set up further comparative and fair tests Report and present findings from enquires, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations (analysing results, anomalies, data etc)	Evolution and inheritance *Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. *Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. *Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. **Sticky Knowledge** *Life cycles have evolved to help organisms survive to adulthood. *Over time the characteristics that are most suited to the environment become increasingly common. *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. -If the environment changes rapidly, some variations of a species may not suit the new environment and will die. -If the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. Over time, these inherited *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. **Working scientifically** *Identify scientific evidence that has been used to support or refute ideas or arguments. *Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. *Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriateRecord data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. *Use test results to make predictions to set up further comparative and fair tests. *Report and present findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations (analysing results, anomalies, data etc.	

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Vocabulary	Electricity, neutrons, protons, electrons, nucleus, atom, electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery holder, motor, buzzer, switch, voltage, conductor, electrical insulator, conductor, Circuit, complete circuit, circuit diagram, circuit symbol, N.B. Children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used interchangeably.	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.	Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent. Reflect Absorb Emitted Scattered Refraction	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle, Oygenated, Deoxygenated, Valve, Exercise, Respiration,blood, artery, vein, pulmonary, alveoli, capillary, digestive, transport, gas exchange, villi, nutrients, water, oxygen, alcohol, drugs, tobacco.	offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils, evolve, evolution, Adaptation, Evolution, Characteristics, Reproduction, Genetics, Variation, Inherited, Environmental, Mutation, Competition, Survival of the Fittest, Evidence,
	TAPs- Bulb Brightness **Enquiry Focus:** Plan a scientific enquiry to answer a question, recognising and controlling variables. **Concept Context** Compare variations in how electrical components function. **Assessment Focus** Can children create a scientific question which identifies the 'change' and 'measure'? Can children identify control variables to plan a fair test? **End Point** **Not yet met:** Can identify what they would like to change but may need support to explain what must be kept the same. **Meeting:** Identify a range of factors which may affect the brightness of the bulb and define a succinct scientific question to test, *e.g. What will happen to the (brightness of the bulb), if we change the (length of wire)?* Able to plan a fair test unaided, identifying the different types of variables: what to measure, what to change, what to keep the same **Possible ways of going further:** Can identify control variables for a range of investigation questions, *e.g. if we look at wire length we need to keep the voltage the same but if we look at voltage we need to keep the wires the same.* Notes difficulties with the 'life' of the components.	**TAPs- Outdoor Key** **Enquiry Focus:** Record the results of a survey using a classification key. **Concept Context** Give reasons for classifying plants and animals based on specific characteristics. **Assessment Focus** Children create questions which separate animal/plant groups? Can children create a clear classification key, using scientific language? **End Point** **Not yet met:** With support, children can group animals and plants according to basic characteristics but may not yet know scientific names or be able to identify more subtle differences *e.g. a worm does not have a skeleton*. Key questions may lack clarity or not result in a yes/no answer. **Meeting:** Children meeting the objective would be able to ask yes/no questions which demonstrate understanding of key differences between types of living things. Children can use the structure of a classification key, placing and ordering questions to support classification *e.g. Does it have a segmented body? Yes - worm, No - does it have a shell? Etc.* **Possible ways of going further:** Can explain the limitations of their key, *e.g. I found a yellow ladybird rather than a red one*. Research further to develop a branching key to identify a selection of plants and animals which are less commonly known.	**TAPS- Investigating Shadows** **Enquiry Focus:** Take accurate measurements and records data on a graph. **Concept Context** Use the idea that light appears to travel in straight lines to explain why shadows have the same shape as their objects. **Assessment Focus** Can children make accurate measurements? Can children plot their results accurately on a line graph? **End Point** **Not yet met:** Requires support to take accurate measurements and needs help to plot points accurately on a line graph. **Meeting:** Uses appropriate equipment to measure, e.g. a protractor for angle of light, a ruler to measure length of shadow to nearest mm. Takes precise measurements which are recorded accurately on a line graph. **Possible ways of going further:** Uses line graph to make further predictions, *e.g. if the angle of the light is 60°, the shadow will be 5cm.*	**TAPs- Heart Rate Poses** **Enquiry Focus:** Use test result to make predictions to set up further comparative and fair tests. **Concept Context** Describe the functions of the heart, blood vessels and blood Recognise the impact of exercise on the way their bodies function. **Assessment Focus** Can children make and explain their predictions based on previous results? Can children carry out a scientific enquiry to answer their question? **End Point** **Not yet met:** Children can explain that where the pulse rate goes up, this indicates that the heart is beating faster. They are aware that different children may have different resting pulse rates. **Meeting:** Children can use their data to make further predictions linking how hard the heart has to work with the heart rate, *e.g. When you are upside down the distance that the blood needs to be pumped upwards is greater, so your heart works harder and beats faster. Therefore, I predict that our pulse rates would rise if we raised our arms as the blood would also be pumped upwards.* **Possible ways of going further:** Can explain that it is important to measure the changing pulse rates of several children to get a good picture of the overall pattern as individuals might vary. Can use their tables or graphs to make predictions about different situations.	**TAPS- Fossil Habitats** **Enquiry Focus:** Identifying scientific evidence that has been used to support or refute ideas or arguments. **Concept Context** Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. **Assessment Focus** Can children use evidence (from fossils or research) to develop ideas? Can children discuss whether evidence supports ideas? **End Point** **Not yet met:** Ideas about the creature are limited or lacking in use of evidence from fossil, research or comparisons with modern animals. **Meeting:** Can explain how fossils are formed. Can identify evidence to support ideas, from fossil, research or comparisons with modern animals. **Possible ways of going further:** Considers what can be known about appearance, habits and habitats from fossil evidence. Describes potential sources of error.

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Subject	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Sparrow hawks **Cycle B**	Forces *Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. * Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. *Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. **Sticky Knowledge** * 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. *A force causes an object to start moving, stop moving, speed up, slow down or change direction. *Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall. *A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves along. **Working scientifically** *Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. *Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.	**Animal including humans** *Describe the changes as humans develop to old age. **Sticky Knowledge** *Human babies grow rapidly when they are young. *Babies are very dependent on their parents for survival. *At puberty, a child's body changes and develops primary and secondary sexual characteristics. *The development of sexual characteristics enables the adult to reproduce. **Working Scientifically** *Identify scientific evidence that has been used to support or refute ideas or arguments. *Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. *Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. *Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	**Properties of materials** ***Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets** ***Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution** ***Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating** ***Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic** ***Demonstrate that dissolving, mixing and changes of state are reversible changes** ***Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda** **Sticky Knowledge** *Materials have different uses depending on their properties and state (liquid, solid, gas). *Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. *Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. Mixtures can be separated by filtering, sieving and evaporation. *Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.	**Earth and Space** *Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. *Describe the movement of the Moon relative to the Earth. *Describe the Sun, Earth and Moon as approximately spherical bodies. *Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. **Sticky Knowledge** *The Sun is a star and it is at the centre of our solar system. *There are 8 planets and these travel around the Sun in fixed orbits. *Earth takes 365¼ days to complete its orbit around the Sun. *The Earth rotates (spins) on its axis every 24 hours and as Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). *As the Earth rotates, the Sun appears to move across the sky. *The Moon orbits the Earth. And it takes about 28 days to complete its orbit. *The Sun, Earth and Moon are approximately spherical. **Working scientifically** *Identify scientific evidence that has been used to support or refute ideas or arguments. *Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	**Living things and their habitats** *Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird *Describe the life process of reproduction in some plants and animals **Sticky Knowledge** ***As part of their life cycle, plants and animals reproduce.** ***Animals, including humans, have offspring which grow into adults.** ***Different classes of animals reproduce in different ways and offspring are born in differing ways.** ***Some insects undergo a process called metamorphosis.** ***Reproduction in plants can be sexual or asexual and involves the process of pollination.** **Working Scientifically** *Identify scientific evidence that has been used to support or refute ideas or arguments. *Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	
Vocabulary	Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gear, Gravity, Newton, push, pull, opposing, streamline, brake, cog, machine	Puberty, the vocabulary to describe sexual characteristics in line with the school's RSE policy life cycle, foetus, baby, child, adolescent, adult, reproduce, sexual, sperm, fertilises, egg, live young	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material	Sun, Moon, Earth, planets (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, Solar System, rotate, star, orbit	Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, cuttings	

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	TAPS- Aquadynmaics **Enquiry Focus:** Explain the degree of trust in the results. **Concept Context** Identify the effect of water resistance. **Assessment Focus** Can children identify variables which may affect the results? Can children evaluate how effectively variables were controlled? **End Point** **Not yet met:** Suggests which shape falls fastest but little recognition of issues with fairness or accuracy. **Meeting:** Evaluates how effectively variables were controlled, e.g. *We couldn't get the position the same because some shapes turned over at the surface slowly, so we didn't know whether to time from when it went in the water, or when it had turned over.* **Possible ways of going further:** Is able to repeat readings independently and explains how this increases accuracy, e.g. *it was difficult to know when to start timing so we took the middle value/mean average of three readings.*	**TAPS- Growth survey** **Enquiry Focus:** Take measurements using a range of equipment. **Concept Context** Describe the changes as humans develop to old age. **Assessment Focus** Can children record and present results clearly? **End Point** **Not yet met:** Can measure accurately in cm. Can record data in pre-made structure. Can identify highest and lowest results, describes pattern with support. **Meeting:** Can measure accurately in cm and mm. Can record data in their own structure. Can identify a pattern, suggest reasons for this pattern, and identify any anomalies. **Possible ways of going further**: Comments on accuracy of measurements, *e.g. if different people are measuring you must agree where to start*. Gives possible reasons for anomalies and indicates how these might be reduced if the investigation was to be repeated.	**TAPS-** **Enquiry Focus:** Gather and record data of increasing complexity using tables **Concept Context** Know that some materials will dissolve in a liquid to form a solution. **Assessment Focus** Can children create their own table for recording results? Can children record data clearly and accurately? **End Point** **Not yet met:** Children note times, but recording is not clear, e.g. measuring time to absorb or time to fall/dissolve. **Meeting:** Pupil recordings clearly show what was investigated. Results are recorded systematically in a table. **Possible ways of going further:** The results table follows the science format of 'change' in the left-column and 'measure' in the right column(s). Pupils recognise the need to repeat measures if they had more time and/or problems with the reliability of their data e.g. *it was hard to tell when it had fallen so we should have done it again to check.*	**TAPS- Craters** **Enquiry Focus:** Gather and record data using tables and graphs. **Concept Context** The Solar System is made up of eight unique planets **Assessment Focus** Can children design simple tables to record results? Can children present results as a bar chart or line graph? **End Point** **Not yet met:** Records measurements in a simple table / graph but needs adult support to record measurements and plot values. **Meeting:** Can make decisions about what to record and where to put information in a simple table and graph. Can calculate/plot mean or median if repeat measurements have been taken. **Possible ways of going further:** Notice and discuss anomalous results or discount them from the data, suggesting possible explanations for them linked to their investigation.	**TAPS- Seed dispersal survey** **Enquiry Focus:** Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar graphs **Concept Context** Describe the life process of reproduction in some plants and animals **Assessment Focus** Can children identify how different plants disperse their seeds? Can children record their survey findings? **End Point** **Not yet met:** Children record their findings but they may be unclear, unlabelled (seed dispersal) or unrepresentative of the area surveyed e.g. drawings of only fruits and no grasses. **Meeting:** Children meeting the objective would be able to record their findings in a way which is clear to others e.g. labelling diagrams with means of seed dispersal or creating a tally chart. **Possible ways of going further:** Considers plants where seed dispersal is not displayed e.g. at a different point in their life cycle or reproduces in a different way. May do additional research to identify unknown plants or find out more about seed dispersal.

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Hands, feet and hearts that make a difference