# KS1 Science Curriculum: Year A and B

**What are the aims and intentions of this curriculum?**

That children:

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

**Curriculum Drivers -**

**Working Scientifically:** Asking simple questions and recognising that they can be answered in different way - Observing closely, using simple equipment - Performing simple tests - Identifying and classifying - Gathering and recording data to help in answering questions

| Term | Topic/Unit | Knowledge | Skills | Enquiry Questions | Vocabulary |
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| Year A Autumn<br><br>Link to Great Fire of London | <u>Materials (Y1)</u><br>Properties of materials<br><br>Materials (Y2)<br>Uses of everyday materials | **(Y1)**<br>• Know the difference between an object and the material it is made from.<br>• Know the names of a variety of everyday materials, including wood, plastic, metal, water and rock.<br>• Know the simple properties of everyday materials.<br>• Know how some materials can be grouped on the basis of their simple physical properties.<br>(Y2)<br>• identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses<br>• find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching | **(Y1)**<br>• Identify common materials.<br>• Compare common materials.<br>• Sort/classify common materials<br>• Observe changes over time.<br><br>(Y2)<br>• Identify different materials.<br>• Classify materials.<br>• Compare materials.<br>• Ask questions that can be investigated or researched. Gather/record information<br>• Report on findings | • Can you identify materials?<br>• Can you group objects by material?<br>• Are certain materials best to be used for certain objects?<br>• Which materials can change their shape? Which materials are flexible?<br>• Which material is best for a tent?<br>• Would a paper boat float over time?<br>• Which materials are waterproof?<br>• Which nappy soaks up the most water? | **(Y1)** Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, metal, rock, stretch, stuff, bend, waterproof, wood, plastic, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, |

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| | | | | • Can I twist sand? Can I twist playdough? Can I twist spaghetti (cooked/uncooked)?<br>• Can I squash playdough into a pot? Can I squash soil into a pot? Can I squash cotton wool into a pot? Can I squash lettuce into a pot? | rough, smooth, shiny, dull, transparent, opaque<br>(Y2) Stretchy, Shiny, Dull, Rough, Smooth, Bendy, Waterproof, Absorbent, Opaque, Transparent Brick, Paper, Fabrics, Squashing, Bending, Twisting, Stretching Elastic, Foil |

**Working scientifically**

| Observe changes over time | Notice patterns | Grouping and Classifying | Comparative tests | Secondary sources |
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| • What happens to materials over time if we bury them in the ground?<br>• What happens to shaving foam over time?<br>• Would a paper boat float over time?<br>• How do shapes of some materials change over time? (wooden bench, shed roof) | • Is there a pattern in the types of materials that are used to make objects in school?<br>• Which materials can change their shape? (squash, bend, twist, stretch) | • Which materials will float and which will sink?<br>• Which material is best for a tent?<br>• Which materials are flexible? | • Which material would make the best umbrella?<br>• What materials are the most absorbent? (absorbent, warm)<br>• Which materials are waterproof? | • What different materials are used for |

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| Possible Activities | • Classify objects made of one material in different ways e.g. a group of object made of metal.<br>• Classify in different ways one type of object made from a range of materials e.g. a collection of spoons made of different materials.<br>• Classify materials based on their properties.<br>• Test the properties of objects e.g. absorbency of cloths, strength of party hats made of different papers, stiffness of paper plates, waterproofness of shelters. |

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| **Suggested investigation** | How strong is an egg?<br>https://www.science-sparks.com/how-strong-is-an-eggshell/ |
| **Key Learning** | (Y1)<br>• All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons.<br>• Materials can be described by their properties e.g. shiny, stretchy, rough etc.<br>• Some materials e.g. plastic can be in different forms with very different properties.<br>(Y2)<br>• 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.<br>• Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness. |
| **COMMON MISCONCEPTIONS** | Only fabrics are materials • only building materials are materials • only writing materials are materials • the word 'rock' describes an object rather than a material • 'solid' is another word for hard. |

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| Seasonal changes continuous | During the first half of the Autumn term, children will observe the changes between Summer into Autumn (noting the changes to weather, day length and trees, e.g. Autumn walk)<br><br>During the second half of the Autumn term, children will observe the changes between Autumn into Winter (noting the changes to weather, drop in temperature, day length and trees, e.g. Autumn walk) |

| Term | Topic/Unit | Knowledge | Skills | Enquiry Questions | Vocabulary |
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| **Year A Spring**<br><br>Link to Geography unit – Wonderful World | <u>Seasonal Changes and Weather (Y1)</u> | (Y1)<br>• Know there are 4 seasons.<br>• Know the types of weather associated with seasons.<br>• Know how day length varies. | • Observe and describe seasonal characteristics.<br>• Gather information.<br>• Record information. | • How does a tree change over the year?<br>• How does the weather change each season?<br>• Which day of the week has the most rain?<br>• Does the wind blow in the same direction every time?<br>• Can I make a windsock?<br>• Is the weather the same in London as it is in Durham today?<br>• What might the weather be like today in Australia?<br>• What might the weather be like on my birthday if I lived in China/Germany/Alaska?<br><br>Could we have some questions focused link to weather around the world/ continents??? | Weather (sunny, rainy, windy, snowy etc.) Seasons (winter, summer, spring, autumn) Sun, sunrise, sunset, day length, Sun, Day, Moon, Night, Light, Dark |

**Working scientifically**

| Observe changes over time | Notice patterns | Grouping and Classifying | Comparative tests | Secondary sources |
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| • How does a tree change over the year?<br>• Length of days<br>• Weather | • Does the wind always blow the same way? | • How would you group these things based on which season you are most likely to see them in? | • Why do we wear different clothes in different seasons? | • Photographs |

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| **Possible Activities** | • Collect information about the weather regularly throughout the year.<br>• Present this information in tables and charts to compare the weather across the seasons.<br>• Collect information, regularly throughout the year, of features that change with the seasons e.g. plants, animals, humans.<br>• Present this information in different ways to compare the seasons.<br>• Gather data about day length regularly throughout the year and present this to compare the seasons. |
| **Suggested investigation** | Making a wind sock and looking at the Beaufort Scale<br>https://di4c76y7libww.cloudfront.net/documents/KS1_Science_Yr_1_Summer_1_Wonderful_Weather_Session_5_Resource.pdf |
| **Key Learning** | • In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again.<br>• The weather also changes with the seasons.<br>• In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer.<br>• The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people. |
| **COMMON MISCONCEPTIONS** | It always snows in winter • it is always sunny in the summer • there are only flowers in spring and summer • it rains most in the winter. |

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| Seasonal changes continuous | During the Spring term, children will observe the changes between Winter into Spring (noting the changes to weather, day length and trees, plants, bulbs, blossom, e.g. Spring walk) |

| Term | Topic/Unit | Knowledge | Skills | Enquiry Questions | Vocabulary |
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| **Year A Summer**<br><br>Link to Geography unit – Seaside | **Living things and their habitats (Y2)** | (Y2)<br>• Know the difference between things that are living, dead and things that have never been alive.<br>• Know that most living things live in a habitat to which they are suited.<br>• Know that different habitats provide the basic needs of different animals and plants. | • Classify<br>• Know which animals live in which habitat.<br>• Use ideas to create e.g. simple food chain.<br>• Ask questions<br>• Collect evidence<br>• Record information<br>• Notice patterns | • Research different habitats.<br>• What are the needs of a habitat?<br>• What conditions do woodlice prefer to live in?<br>• How would you group things to show which are living, | **(Y2)** Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed |

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| | | • Know how plants and animals depend on each other.<br>• Know the names of plants and animals and their habitat (including micro-habitats) | • Draw a conclusion (with support) | dead or have never been alive? Would we find the same creatures in a flowerbed and in a rockpool? | Names of local habitats e.g. pond, woodland etc. Names of micro-habitats e.g. under logs, in bushes etc. |

| Working scientifically | | | | |
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| Observe changes over time | Notice patterns | Grouping and Classifying | Comparative tests | Secondary sources |
| • What will happen to ice in the classroom?<br>• What would happen if all the trees were cut down?<br>• What would happen if we didn't have the sun?<br>• How would you group things to show which are living, dead or have never been alive? | • Research different habitats.<br>• What are the needs of a habitat?<br>• What conditions do hermit crabs prefer to live in? | • How would you group things to show which are living, dead or have never been alive? | • Would we find the same creatures in a flowerbed and in a rockpool? | • Labelling what we find in a rock pool |

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| **Possible Activities** | • Explore the outside environment regularly to find objects that are living, dead and have never lived.<br>• Classify objects found in the local environment. • Observe animals and plants carefully, drawing and labelling diagrams.<br>• Create simple food chains for a familiar local habitat from first-hand observation and research.<br>• Create simple food chains from information given e.g. in picture books (Gruffalo etc.). |
| **Suggested investigation** | Microhabitat investigation within the school grounds: https://www.hamilton-trust.org.uk/science/unit/691-microhabitats/<br>YouTube video Microhabitats in School - https://youtu.be/5mXEsvrJUnU<br>BBC Bitesize video – microhabitats - https://www.bbc.co.uk/bitesize/clips/zf6mhyc |
| **Key Learning** | • 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 (This is a simplification, but appropriate for Year 2 children.)<br>• 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).<br>• 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. |

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| | • 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. |
| COMMON MISCONCEPTIONS | • An animal's habitat is like its 'home' • plants and seeds are not alive as they cannot be seen to move • fire is living • arrows in a food chain mean 'eats'. |

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| Seasonal changes continuous | During the Summer term, children will observe the changes between Spring into Summer (noting the changes to weather, day length and trees, links to sun safety etc) |

| Term | Topic/Unit | Knowledge | Skills | Enquiry Questions | Vocabulary |
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| Year B Autumn<br><br>Link to History unit – Explorers | Animals, including humans (Y1 and Y2 unit) | (Y1)<br>• Know basic parts of the human body.<br>• Know which parts of the body are associated with each sense.<br>• What are the five senses and how do we use these to find out about the world<br>• Explain their ideas as responses to an issue.<br><br>(Y2)<br>• Know the basic needs of animals, including humans (water, food, air)<br>• Know that exercise, eating the right amounts of different foods and hygiene are important to humans. | • Observe changes over time.<br>• Identify patterns.<br>• Ask questions<br>• Research (using secondary sources)<br>• Explore e.g. use of exercise on the body. | • How much do I grow over the year?<br>• Do the people with the biggest hands have the bigger feet?<br>• What are the names for all our body parts?<br>• What can our body parts do?<br>• Are the oldest children the tallest?<br>• What are my senses?<br>• Can I taste without smell?<br><br><u>Y2</u><br>• What are the requirements for a healthy meal?<br>• Are the oldest children the fastest?<br>• What is the best way to clean our hands? | (Y1)<br>Parts of the body including those linked to PSHE teaching Senses – touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue<br><br>(Y2)<br>exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta) |

| Working scientifically | | | | |
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| Observe changes over time | Notice patterns | Grouping and Classifying | Comparative tests | Secondary sources |
| • How does my height change over the year? | • Do people with the biggest hands have bigger feet?<br>• What are the requirements of a healthy meal? | • What are the names for all the parts of our bodies?<br>• What can our body parts do? | • Are the oldest children the tallest? | • What are my senses? |

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| Possible Activities | • Make first-hand close observations of parts of the body e.g. hands, eyes.<br>• Which food/flavours can I identify by taste? Which smells can I match?<br>• Make first-hand close observations of parts of the body e.g. hands, eyes.<br>• Compare two people.<br>• Take measurements of parts of their body.<br>• Compare parts of their own body.<br>• Look for patterns between people e.g. Do people with big hands have big feet?<br>• Classify people according to their features.<br>• Investigate human senses e.g. Which part of my body is good for feeling, which is not? *Which food/flavours can I identify by taste? *Which smells can I match |
| Suggested investigation | RSPB Big Birdwatch - https://www.rspb.org.uk/get-involved/activities/birdwatch/ (classifying)<br>Twinkl Pets Experiment - https://www.twinkl.co.uk/resource/amp/t-t-2546589-eyfs-pets-science-experiments-resource-pack<br>Explorify Zoom In Zoom Out activity (need to sign up for Explorify but it's free to do so) - https://explorify.uk/en/activities/zoom-in-zoom-out/creature-comforts |
| Key Learning | (Y1)<br>• Humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body.<br>(Y2)<br>• 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.<br>• 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. |
| COMMON MISCONCEPTIONS | •Only four-legged mammals, such as pets, are animals • humans are not animals respiration is breathing • breathing is respiration. |

| Term | Topic/Unit | Knowledge | Skills | Enquiry Questions | Vocabulary |
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| Year B Spring<br><br>Link to Geography - Local area study<br><br>Visit to Botanic Gardens | Plants (Y1 and Y2 units) | (Y2)<br>• identify and name a variety of common wild and garden plants, including deciduous and evergreen trees<br>• identify and describe the basic structure of a variety of common flowering plants, including trees<br><br>(Y2)<br>• Know how seeds and bulbs grow into mature plants.<br>• Know that seeds need water, light, and warmth to grow and stay healthy. | (Y1)<br>• Identify common plants and trees<br>• Compare plants and trees.<br>• Observe changes over time.<br>• Group/sort plants and trees<br>• Draw and label plants and trees.<br>• Ask questions (that can be investigated or researched).<br><br>(Y2)<br>• Name<br>• Identify plants<br>• Observe plants, seeds and bulbs.<br>• Group plants<br>• Gather information<br>• Report on findings. | (Y1)<br>• How can we sort the leaves that we collected on our walk?<br>• What plants can you find in our school?<br>• Do all plants look the same?<br>• Which tree has the biggest leaves?<br>• How does a daffodil bulb change over time?<br>• Can you name the parts of a tree and flowering plant?<br>• What do plants need to grow well?<br><br>Y!<br>(Y2)<br>• Do bigger seeds grow into bigger plants?<br>• How many different ways can you group these plants?<br>• Do cress seeds grow quicker inside or outside?<br>• What happens to my bean after I planted it? | (Y1)<br>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud<br>Names of trees in the local area Names of garden and wild flowering plants in the local area<br><br>(Y2)<br>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud<br>Names of trees in the local area<br>Names of garden and wild flowering plants in the local area – e.g. bluebells, poppies<br>Light, shade, sun, warm, |

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| Working scientifically | | | | |
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| Observe changes over time | Notice patterns | Grouping and Classifying | Comparative tests | Secondary sources |
| • How does a daffodil bulb change over the year?<br>• What happens to my bean after I planted it?<br>• Watching a YouTube video of a plant growing (sped up) to observe changes. | • Do bigger seeds grow into bigger plants?<br>• Is there a pattern in where we find moss growing in the school grounds? | • How many different ways can you group these plants?<br>• How can we sort the leaves that we collected on our walk? | • Do cress seeds grow quicker inside or outside?<br>• Which tree has the biggest leaves? | • Photographs of plants, leaves, seeds, flowers<br>• YouTube clip bean time lapse 25 days |

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| Possible Activities | (Y1)<br>• Make close observations of leaves, seeds, flowers etc.<br>• Compare two leaves, seeds, flowers etc.<br>• Classify leaves, seeds, flowers etc. using a range of characteristics.<br>• Identify plants by matching them to named images.<br>• Make observations of how plants change over a period of time.<br>• When further afield, spot plants that are the same as those in the local area studied regularly, describing the key features that helped them<br><br>(Y2)<br>• Make close observations of seeds and bulbs.<br>• Classify seeds and bulbs.<br>• Research and plan when and how to plant a range of seeds and bulbs.<br>• Look after the plants as they grow – weeding, thinning, watering etc.<br>• Make close observations and measurements of their plants growing from seeds and bulbs.<br>• Make comparisons between plants as they grow. |
| Suggested investigation | Bean in a jar - https://www.science-sparks.com/bean-in-a-jar/<br>Video Brian Cox School Experiments – do plants need soil? https://www.youtube.com/watch?v=iGUmfm4Gdkk<br>Bean growing time lapse video - https://www.youtube.com/watch?v=w77zPAtVTuI<br>Planting sweetpeas |

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| Key Learning | (Y1)<br>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.<br><br>(Y2)<br>• Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc.<br>• Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates.<br>• Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy. |
| COMMON MISCONCEPTIONS | •Plants are not alive as they cannot be seen to move • seeds are not alive • all plants start out as seeds • seeds and bulbs need sunlight to germinate.<br><br>•Plants are flowering plants grown in pots with coloured petals and leaves and a stem • trees are not plants • all leaves are green • all stems are green • a trunk is not a stem • blossom is not a flower. |

| Term | Topic/Unit | Knowledge | Skills | Enquiry Questions | Vocabulary |
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| Year B Summer | Animals, including humans (Y1) and offspring from Y2 | (Y1)<br>• Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals<br>• identify and name a variety of common animals that are carnivores, herbivores and omnivores<br>• describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)<br><br>(Y2) | *Name<br>*Describe<br>*Identify<br>*Ask questions<br>*Research (using secondary sources) | • How does a hedgehog/fox change over time? -<br>• How does a tadpole change over time?<br>• *Does a fox's baby look like an adult bear? Does a robin's?<br>• How do different animals change as they grow? (life cycle) – butterfly, frog? | (Y1)<br>Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves • Names of animals experienced first-hand from |

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| | | • Know that animals including humans have offspring that grow into adults. | | • How can we group/organise farm/zoo animals? | each vertebrate group<br><br>(Y2)<br>Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult,caterpillar/ butterfly), |

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| Observe changes over time | Notice patterns | Grouping and Classifying | Comparative tests | Secondary sources |
| • Life cycles of tadpoles and caterpillars -Birds and names | Do all woodland creatures eat the same thing?<br>What would a hedgehog eat over the course of a day, what about a fox or a robin?<br>Do all foxes live in the same place (think about British foxes as well as Arctic etc)<br>Do all birds live in the same place? | • Can you group animals in different ways?<br>• How can we organise all the zoo animals?<br>• How could we organise the woodland/farm animals?<br>• Compare woodland animals/birds/minibeasts compared based on similarities and differences. | • Would we find the same birds in a tree in Durham as we would in the Lakes? What about in the Caribbean? Or Alaska?<br>• What would be the ideal home for a British fox compared to an Arctic fox? | • Insectlore.co.uk insect kits for butterflies, silkworms<br>• Naming a variety of common animals including fish, reptiles, mammals, birds, amphibians<br>• Photographs/YouTube videos of lifecycles (sped up) as well as animals from different countries/continents. |

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| Possible Activities | • Make first-hand, close observations of animals from each of the groups.<br>• Compare two animals from the same or different groups. •<br>• Classify animals using a range of features.<br>• Identify animals by matching them to named images.<br>• Classify animals according to what they eat. |

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| **Suggested investigation** | Make a healthy sandwich (cooking/DT link)<br>Handwashing investigation with slices of bread: https://www.sciencealert.com/this-simple-experiment-with-bread-is-a-genius-way-to-get-kids-to-wash-their-hands |
| **Key Learning** | • 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.<br>• Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals. 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.<br>• |
| **COMMON MISCONCEPTIONS** | • Only four-legged mammals, such as pets, are animals • humans are not animals • insects are not animals • all 'bugs' or 'creepy crawlies', such as spiders, are part of the insect group • amphibians and reptiles are the same<br>• An animal's habitat is like its 'home' • all animals that live in the sea are fish |