	Science	Year 4
	Term 5	Topic Title: Living Things and their Habitats

Key Question: What helps us to classify and protect living things in their environments?

National Curriculum Objectives:
Recognise that living things can be grouped in a variety of ways.

Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.

Recognise that environments can change and that this can sometimes pose dangers to living things.

Vocabulary: (Revisit Y1-3 vocabulary in this unit, plus)
Classification, classification keys, environment, habitat, microhabitat, human impact, positive, negative, migrate, hibernate, pollution, pollutant, aquatic.
National Curriculum requirement: Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

Children will need further opportunities to explore and embed key scientific vocabulary outside of Science lessons through the wider curriculum and spelling lessons/homework activities.

Prior Learning:
Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants)
• Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)
• Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans)
• Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans)
• Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things/habitats)

Common misconceptions:
- The death of one of the parts of a food chain or web has no or limited consequences on the rest of the chain
- There is always plenty of food for wild animals
- Animals are only land-living creatures
- Animals and plants can adapt to their habitats, however they change
- All changes to habitats are negative.

Knowledge: Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things.
Living things live in a habitat which provides an environment to which they are suited (Yr 2). These environments may change naturally e.g. through flooding, fire, earthquakes etc.
Humans also cause the environment to change. This can be in a good way (i.e. positive human impact e.g. setting up nature reserves, tree planting, things we make for the wildlife area) or in a bad way (i.e. negative human impact, such as littering).
These environments also change with the seasons; different living things can be found in a habitat at different times of year.

Investigative skills

Fair/comparative testing	Identify & Classify	Observation over time	Pattern Seeking	Research
How does pollution affect local habitats? Answer questions posed by the teacher through setting up a fair test. Chn recognise when secondary sources can be used to answer questions that cannot be answered through practical work. Use results to draw simple conclusions, suggest improvements and raise further questions that can be answered by extending the same enquiry. Record findings orally and in writing using scientific	*Can we use the classification keys to identify all the animals that we observed in the wildlife area?* Use simple secondary sources (ID sheets and keys) to name, sort and group living things. Present the same data in different ways in order to help with answering the question (with support.)	*How does the variety of invertebrates in the wildlife areas change over the year? (Task from seasonal box- ongoing)* *How does pollution affect local habitats?* Record findings using simple scientific language, drawings, labelled diagrams, keys, charts and tables. Chn sometimes decide how to record and present evidence and use partially filled templates	*How does the temperature of the pond water change in each season?* *Is there a relationship between the temperature/season and presence of living things in this habitat?* Use a range of equipment including thermometers to measure temperature and use standard units to record data. Answer questions from measurements taken. Begin to identify naturally occurring patterns.	*Research facts about Steve Backshall.* *How has the use of insecticides affected the bee population?* (learn about importance of bees on our ecosystem Y2) *(How is climate change affecting the world/animals? Y5)* Chn recognise when secondary sources can be used to answers questions that cannot be answered through practical work.

language.		to add to.		

Significant Scientists: **Steve Backshall-** English naturalist **Cindy Looy-** Environmental Change and Extinction **Greta Thunberg**- Environmental *activist* (not Scientist)	**End point:** Can name living things living in a range of habitats, giving the key features that helped them to identify them Can give examples of how an environment may change both naturally and due to human impact. Can keep a careful record of living things found in different habitats throughout the year (diagrams, tally charts etc.) Use classification keys to identify unknown plants & animals. Can present their learning about changes to the environment in different ways e.g. campaign, pledge, persuasive letter
Science stories: **Fur and feathers-** Janet Halfmann	
Cross Curricular Links: ICT- Branching databases	**Oracy:** Odd one out. Create a **conscience alley** to discuss advantages and disadvantages of the use of chemicals in nearby farmland.

Wider Reading	**Enrichment**
Natural History museum info on taxonomy and naming nature Background information on bees (and their decline) A creative approach to teaching Science-Nicky Waller 101 small ways to change the world- (Lonely Planet kids) Aubre Andrus	Use of wildlife area LKS2 Seasonal box Trip to Wisley Gardens/ Baylab bees and honey workshop RHS Sowing seeds/tree planting opportunities.

Sequence of Learning		
Lesson	Key Question	Key learning/notes
1	How are animals and plants adapted to their habitats? N.B: look out for chn who describe non-living as "dead" as this is not always the case if have never been alive. Also ensure that chn undersand that animals rely on both living and non-living aspects of the environment for survival.	• Remind chn of MRS NERG (first met in Year 2) – mnemonic for the seven characteristics of living things. Complete pre-unit quiz. • Provide vocabulary cards on each table (habitat, microhabitat, environment, adapted, non-living). Chn choose one to describe to the rest of the group. If too tricky, pick another but all children must try to explain something. Discuss and feedback on key vocabulary as a class to embed definitions/initial understanding and unpick misunderstandings from each group. • Define a habitat (including micro-habitats) and revisit YR2 unit question for initial assessment ***"How do plants and animals rely on their habitats?"*** What can children remember? Establish that animals and plants live in a particular habitat to meet their basic needs and are suited to those habitats (simple explanations.) • **"A habitat is a creature's home" agree/disagree?** Address any misconceptions. • Once chn recap how living things rely on their habitats, now deepen understanding by focusing on varying conditions and adaptations to habitats. (light, temperature, moisture.) Compare and contrast adaptations of plants and animals in extreme environments. *(Focus predominantly on animals but make sure that children generate "wonders" for their trip to Wisley to explore plants in more detail.)* • *Read and discuss "fur and feathers."* • Chn name living things in a range of habitats. Can they match the living thing to an appropriate habitat? What makes it suitable? Complete online habitat quiz as a class.
2	How can we identify different living things?	• Play a mixed-up animal/plant game (similar to in KS1) What do children think it is> (Encourage them to generate questions that would lead to some sort of answer e.g how many legs does it have? Does it have hair or fur? Does it have wings? Does it have petals? Does it have a stem?) Separate the creatures and now play odd one out to further explore their features. Which one is the odd one out and why? • Explain that there are about 9 million different living things on Earth- why is it useful to classify them to aid identification? • **Introduce key scientist Steve Backshall.** Watch clips of his work and research some facts about him. Can they create a mini-biography about this scientist? • Expose chn to scientific diagrams of classification methods (deepened in Y6

		where chn will learn about Carl Linnaeus). • What questions/wonders do they have about the natural world around them? (show a nature clip/use a picture of a variety of aspects of the natural world as a stimulus to steer them towards adaptations/natural phenomenon and help them think about what they would like to find out.) Create a Woodland "Wonder"land or similar to display their questions and prior knowledge to add to throughout the unit on a working Science wall.
3	What living things can we find in our local environment?	• **Show worms concept cartoon 7.2 (pg48 Naylor and Keogh)** Discuss ideas in small groups then chn place their ideas on post its, record on ipads (create QR codes to print and stick in their books) or scribe on a flipchart/ideas board. • Discuss types of habitat in and around our local area. What would we expect to see this time of year? (elicit prior knowledge from ks1- chn to think of plants as well as animals for a balanced focus) • Show clip (earthworms.) Why are they an important for our gardens and woods? • Observe and/or collect minibeasts and record them and any evidence (including plants) to show why the habitat is suitable for them. • Use identification charts and the seasonal box to carry out activities. What differences/similarities and new knowledge and observations can they make from Year 2? **Think particularly about seasonal change**. Will these creatures/plants be here all year round? What is missing from the area that would have been here in (various seasons) Why? • Show clip about how living things break down leaves to spark further curiosity and reflect on seasonal change.
4	How can we classify the living things in our environment?	• Play "whole class key" (best to take outside). Ask class to suggest a way of dividing the class into two groups/subcategories. They must think of a question. That can only be answered with a yes/no. Agreed question could be written on a card or in chalk on the playground with arrows drawn facing outwards in different directions (yes/no.) Every child answer the question physically by following the arrow and standing in a new location. Continue the process of generating questions and asking chn to group themselves according to responses until every child stands alone with their own mini whiteboard/sticker with their name displayed. • Back inside, reinforce the system visually in smaller groups or partners, using liquorice allsorts (or similar) to model how simple classification keys work. Talk about different features e.g. round or square? Smooth or rough surface? Number of different colours? • Introduce/revisit Purple Mash databases for creating branching databases or dichotomous keys. • Chn create their own branching keys/ classification key for the minibeasts collected in previous lessons. • Check each other's and explore the questions to identify the living thing! • Can children relate their understanding to the wider world and create classification keys for creatures in contrasting habitats?
5	How does pollution affect habitats? Investigation: How does pollution affect a local habitat? Use cornerstones Love to investigate y4- scanned copy available in y4 Science resource folder.)	• What does pollution mean? What pollutants might you find in water? Where do they come from? • Children set up their investigation by preparing containers with water and a pollutant e.g. detergent, satl, plant fertiliser... (Keep a control with just water.) • Group children to monitor one of the polluted waters. Children to come up with a group prediction on a post-it and add around a class flipchart mind map for each pollutant and discuss each as a class, comparing ideas before writing fuller, more detailed individual predictions into their books. • Add small pieces of pondweed from the school pond then observe daily over a minimum of two weeks. Take photos to record observations of time and record any changes. Chn take notes for their container under subheadings **I see, I notice, I wonder**. These can be simple bullet points.)
6	**How do changes in the environment pose dangers to living things?** **N.B: Please do not simply repeat silent food**	• Remind chn of the feeding relationship (food chains) between different living things in a particular habitat (Y2). • Use STEM resources to practically explore how food chains can be built into complex webs and weave one together through the "web of life." • Discuss what happens if one link in the chain is removed. **What could cause this disruption to the food chain?** Encourage chn to suggest ideas. (destruction of habitats by nature or human behaviour eg building, seasonal change, loss of food source etc (ensure chn understand that changes are not purely caused by humans.)

	chains/foxes and rabbits as they have completed these in Y2)	• Focus on farming as a scenario and discuss pesticides and insecticides. Use laminated ladybirds and an outdoor space for chn to role play being birds to explore the scenario of pest control and the effect it would have on our birds. What other areas of wildlife might these actions cause problems for? (e.g pollution of rivers, the bee population) • Children to research how insecticides are affecting the bee population and how this in turn affects us. • Create a **conscience alley** to discuss advantages and disadvantages of the use of chemicals in nearby farmland.
7	**What positive changes can humans make to the environment?**	• Introduce and discuss Greta Thunberg and some of her principles, along with organisations such as Greenpeace and other wildlife foundations. • What changes would have a positive effect on wildlife/ habitats? • Encourage children to think about and explore the school wildlife areas. What aspects of the areas are natural and which have been made and placed deliberately? Why are they there? How does this benefit the nature that occurs there? (bug hotels/pond/bird boxes and feeders.) • Can children make suggestions of further things we can do to support and protect our local wildlife in and around school? • Whilst in the wildlife area, complete some seasonal box challenges including **noting the temperature of the pond**. How does the temperature of the pond water change in each season? Is there a relationship between the temperature/season and presence of living things in this habitat? (Revisit over the year and into next year group) Can they spot any new visitors? Has anything changed? Encourage children to observe the healthy pondweed and aquatic plants as a visual comparison for their ongoing investigations. • Check on the investigation and add to observations (**I see, I notice, I wonder**.)
8	**What helps us to classify and protect living things in their environments?** Assessment lesson.	• Return to, and finish up writing observations from investigation. Come to the conclusion that different pollutants can put aquatic plants and habitats at risk (to varying degrees.) • Reflect on last lesson and remind children that not all changes are bad. Encourage children to become eco warriors in and around school to make positive changes. Children to write a pledge/ guide to looking after living things and their environments to show their understandings of the impact of changes and the types of living things that may be affected. • Complete the **end of unit quiz** and explore and address some of their wonders from the unit. Is there anything that hasn't been explored that could be investigated in the curiosity curriculum unit? (outdoor learning)