	Science	Year 5
	Term 6	Topic Title: Living Things and their Habitats

Key Question: Do all plants and animals follow the same life cycle?

National Curriculum Objectives:

- 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.

Vocabulary:
Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings

National Curriculum requirement: Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

Prior Learning: Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, inc humans) Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)

Common misconceptions:

- all plants start out as seeds
- all plants have flowers
- plants that grow from bulbs do not have seeds
- only birds lay eggs.

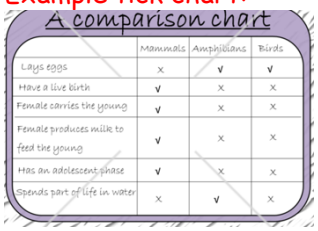
Knowledge: As part of their life cycle, plants and animals reproduce. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis. Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects.

Investigative skills

Fair/comparative testing	Identifying and classifying	Observations over time	Pattern seeking	Research
Can we use seeds from a plant to regrow a new plant? Investigate the re-growth of new plants from cuttings and to record findings including measurements to compare and differences in growth rates. *How does the temperature affect how much gas is produced by yeast? (Y6 living things and their habitats)*	*How can animals be categorised?* Compare this collection of animals based on similarities and differences in their lifecycle. *Can you identify all the stages in the plant life cycle?* *Can you identify all the stages in the human life cycle?* Identify differences, similarities or changes relating to scientific ideas and processes. Report and present findings in oral and written forms such as displays and scientific diagrams. *How can we classify all living things based on their characteristics? (Y6 living things & habitats)*	*How does an insect change over time? (Butterfly experience)* Make systematic and careful observations. Identify differences, similarities or changes relating to scientific ideas and processes. Report and present findings in oral and written forms such as displays, posters and presentations. *What happens to a piece of bread if you leave it on the windowsill for two weeks?* *Can household organic waste be composted and made into usable soil? (Y6 living things and their habitats)*	*Is there a relationship between a mammal's size, its gestation period and the number of offspring it produces?* Report and present findings from enquiries including causal relationships. Use relevant scientific language to discuss, communicate and justify their scientific ideas. Recognise which secondary sources will be most useful and begin to separate opinion from fact. *Do all flowers have the same number of petals?* *Which is the most common invertebrate on our school playing field? (Y6 living things and their habitats)*	*What are the differences in life cycles of a mammal, an amphibian, an insect and a bird?* *Are all animals pregnant for the same amount of time?* *Do only birds lay eggs?* *Chn's own questions* Recognise which secondary sources will be most useful to research. Report and present findings in oral and written forms such as displays and presentations. *Who is Carl Linneaus?* *What do different types of microorganisms do?* *Are microorganisms always harmful? (Y6 living things and their habitats)*

Significant Scientists: **Jane Goodall-** primatologist and anthropologist	**End point:** Can draw the life cycle of a range of animals identifying similarities and differences between the life cycles Can explain the difference between sexual and asexual reproduction and give examples of how plants reproduce in both ways. Can present their understanding of the life cycle of a range of animals in different ways e.g. drama, pictorially, chronological reports, creating a game Can identify patterns in life cycles Can compare two or more animal life cycles they have studied Can explain how a range of plants reproduce asexually
Science stories: The World is Full of Babies! -**Mick Manning and Brita Granström** **Mummy laid an egg-** Babette cole The land of neverbelieve- **Norman Messenger**	
Cross Curricular Links: **English:** Make a presentation with information posters, ppts and visuals. **Maths:** Use charts and tables to interpret and record data. Take measurements, record data and answer sum and comparison questions on growth rates. **ICT:** Use ppt/slideshows to present findings. Use search engines for research.	**Oracy:** Yes/question sorting activity to generate questions to compare and classify.
Wider Reading and resources	**Enrichment/ Science capital**
National Geographic Life cycles of plants & parts of a flower. BBC Bitesize plant life cycle. A creative approach to Science- Nicky Waller Jumpstart Science-games and activities- R. Feasey & D. Fulton www.STEM.org.uk Twinkl Y5 Living things and their habitats resources.	Class planters and plant monitors. Class plant: Spider plant. Use of the wildlife area and pond. Re-growing plants project for homework (parental engagement) Use of quadrats to estimate and count plants (prep for KS3).

Sequence of Learning		
Lesson	Key Question	Key learning/notes
1	How can animals be categorised?	• Complete pre-unit quiz for initial assessment. • Recap key prior knowledge through physical sorting: secure a label onto the back of every child so that they cannot see what animal they are. Have a mixture of mammals (whale, kangaroo, mouse, gorilla, human); amphibians (frog, newt, salamander); insects (beetle, moth, ant, bee, ladybird) and birds (flamingo, owl, penguin, peacock, blackbird etc) • Children should move around the room asking yes/no questions in order to identify which animal they are. (Provide examples: e.g Do I have a tail? Am I originally a UK creature? Etc. Once chn know which animal they are, play a game of corners- chn listen to a number of statements covering content from previous yr groups in this unit and then group themselves accordingly. E.g I am nocturnal/I am not nocturnal (diurnal), I am a predator/I am prey, I am a carnivore/omnivore/herbivore, I am a mammal/amphibian/insect/bird. • Once physically sorted, chn work together in their final groups to produce a definition of what it means to be part of that group. Give chn scaffolds "can" "have" "are" to help them think of defining features: mammals CAN produce milk, mammals HAVE hair on their bodies and mammals ARE warm blooded. • Children to create a unit topic page in their Science books to present their KWL. (what they know, what they wonder about the topic then eventually what they have learned in a different colour.)
2	What are the differences in life cycles of a mammal, an	• Alongside real-life creature experiences such as caterpillars/butterflies to observe over time (tbc) Chn form expert teams to research the life cycles of specific animals from the various groups using secondary sources (life cycle clips on the internet, books

	amphibian, an insect and a bird? (Two lessons for planning, rehearsal, presenting and recording) Example tick chart:  (Real-life observation over time)	from the library, reaching out to real life experts etc.) • Once they have gathered all of their research, children plan and present their information to the rest of the class including diagrams, use of ppt slideshows with short slide transitions to show the life cycle process. Children should have some form of physical poster or display to hold up alongside their shows for the class to discuss and reflect on differences at the end of the lesson. Take photos of their work including notes/research display and slides to stick in books. • Give children templates of life cycles (resources) to compare and make notes on in their books through a comparison tick chart, They can make additional observations under I see, I notice, I wonder or highlight any additional differences by using colour-coding keys on the life cycle diagrams if they wish. (They do not need to write explanations of each stage as they should have covered this through their group presentations- focus on comparisons.) • Keep taking photographs and create an observation book/or use the ws floor book for children to make notes in upon observing their real-life creature and how it changes over time.
3	What are the stages of a plant's life cycle? **Class plant:** Spider plant- have the plant on display and recruit plant monitors to be responsible for watering. Look out for spider plantlets (spider plant babies!) How has that happened?	• Look at the plant life cycle on BBC bitesize and discuss the background information. Ask chn to help you use the resource on the bitesize page: Starting from germination, put the flowering plant's life cycle in order recap of Year 3 and introduction of new vocabulary.) Can children remember the parts of a flower? Explore parts needed for reproduction by playing the loop card game to recap. Children to complete the parts of the flower diagram and write explanations of each function to revise the key vocabulary from Year 3. • Recap processes of pollination, fertilisation and seed dispersal more in depth. Explain that we are looking at sexual reproduction in plants. Main parts we are focusing on are the male and female (M= anther + pollen) (F= carpel) BOTH of these parts are involved in pollination – Chn to check and refer to M and F parts on their ow filled diagrams. What is pollination? What animals are pollinators? Show images on the board and briefly discuss features that allow the animals to do this. • Chn to move on to complete pollination sheets (resources). After plant is pollinated – pollen travels down the stigma for fertilisation. • Discuss seed dispersal – rewatch BBC clip – Chn to write about each type of dispersal next to self-drawn pictures. • What are the stages of a plant's life cycle? Do children understand the key processes of sexual reproduction in plants?
4	What is the difference between sexual reproduction and asexual reproduction in plants?	Use the adapted Twinkl ppt (resources) on plant reproduction to review key points and introduce new vocabulary- **asexual reproduction**. We know from the clip yesterday that plants reproduce **both sexually and asexually**. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Recap that sexual reproduction occurs through pollination, usually involving wind or insects. • Children to complete the differentiated Twinkl resource sheets to explore the advantages of each type of reproduction using a carroll diagram. (Where possible, encourage children to copy into books rather than use the worksheet. Allow cutting and sticking for LA writers.) • Can we use seeds from a plant to grow a new plant? Present chn with a range of seeded vegetables and fruits (peppers, pumpkins, apples, tomatoes, watermelons etc). Can children suggest a way to grow new plants from this selection? Allow children to "dig out" the seeds and wash them thoroughly. Using the class planter or additional pots in pairs, let children plant their seeds in an attempt to grow a new plant. (They should realise that the seeds may or may not grow and recap what is needed to grow healthy plants) Explain that children are now responsible for their plants from now on. They should revisit it regularly and take notes/measurements of its progress. • Can anyone suggest another way of re-growing vegetables? For a class experiment, cut the top off a carrot and place in a saucer of water on a

		sunny window spot. (or place the stub from celery upright in a shallow dish of water) Plant monitors should change the water every few days and observe how the plants will sprout new foliage and hopefully thrive! • **Homework challenge:** Ask chn to investigate at home what other plants they can re-grow by using **cuttings** in this way and to record their findings and look for differences in growth rates.
5	How do different animals develop and grow? Read The world is full of babies!	• Read Shakespeare's 'All the World's a Stage' – this describes the life cycle of a human in seven stages. Talk about the stages in the growth and development of humans and discuss the relative lengths of each stage. Use secondary sources to compare lengths of stages e.g. gestation period, life span, for different animals (resources website list). Discuss the age at which different animals are able to reproduce and the fact that some animals have a large number of offspring, while others like humans have only a few offspring and take many years to grow into adults. • Read **The World is Full of Babies!** to stimulate discussion about the range of gestation periods, how quickly some young develop, how different skills are needed for survival by different animal babies, etc. • Almost every animal uses sexual reproduction (male and female combined) to create offspring. • Introduce the term "gestation period" and explain that these vary between animals. Chn use the STEM worksheet to compare the gestation periods of various animals and complete a table using secondary sources of information which look at gestation period, average number of offspring and the life span of the animal. They then answer questions which look at patterns in the data and go on to predict the length of gestation and no. of offspring for different sized animals. • **Chn research:** Do all animals either give birth to live young or lay eggs? Why do some animals lay more eggs than they need? Can any male animals have babies? How do interesting animals such as seahorses, sharks, stick insects or fresh water turtles produce babies? Are all animals pregnant for the same amount of time? What can you find out about the gestation periods of different animals? Ask chn to add their own questions in to research and feedback.
6	What is metamorphosis and which animals go through it?	• Ask the key question. Can any chn explain it? Allow a few pupils to have a go at explaining before presenting a final definition. Which animals go through metamorphosis? (Amphibians and insects) • Look over the notes and observations of the caterpillars/ butterfly nets. What changes have we noticed in our caterpillar? • Work through the Twinkl ppt on metamorphosis and complete the activities to further compare life cycles. Can children create an acrostic poem to describe the key aspects of metamorphosis using their real-life observations and knowledge from today's lesson? Encourage them to use as much scientific language as they can from provided word banks and their work in previous lessons. How much more can they tell you know compared to when they compared some of these life cycles in KS1? • Celebrate the caterpillar's transformation and release the butterfly safely into the natural environment. (Painted lady butterflies are native to the UK.)
7	Do all plants and animals follow the same life cycle? **Assessment lesson.**	• Use a talk ball to recap key learning then complete the end of unit quiz. (pg62 Jumpstart Science for instructions-scanned pages in resources) • Children to add what they have learned to their unit topic pages as well as answer any of their wonders if they can. Do they have any new wonders that they would like to research for themselves? • Reiterate key points and some interesting facts: Asexual reproduction is used by many plants, e.g. spider plants, bacteria, yeast, and jellyfish. It is also involved in the creation of identical twins, when one zygote splits into two identical copies. Sexual reproduction is used by most mammals, fish, reptiles, birds and insects and requires both male and female parts to work together. • Check on all planting activities and reflect on the results. What has it

		told us about the life cycle of a plant and its reproduction processes? Has our spider plant developed any plantlets? How has that happened/what has taken place? (Asexual reproduction)