'We grow and learn with the gifts we have been given, following in the footsteps of Jesus'	
Unit Plan	Year 5 Living things and their habitats - Biology.
Substantive Knowledge	Describe the differences in life cycles of a mammal, an amphibian, an insect and a bird Describe the life process of reproduction in some plants and animals
Disciplinary Knowledge	• planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations • identifying scientific evidence that has been used to support or refute ideas or arguments
Prior Learning	Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans) Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)
Enhancements	Book/science capital – Jane Goodall, David Attenborough Cross curricular: PSHE- growing up and reproduction. Maths- Using keys and grouping. Creating recording tables and looking for patterns. Plotting on a graph. English- spell scientific vocabulary correctly. Report findings in a logical way. Geography- different climates and explore how animals are adapted to different climates. Sustainability- Explore different types of pollution and the effects on animals. MFL- Learn animal names in a different language. History- learning about scientists of the past and present.
CST Links and Catholic Curriculum- heart and hand	Link to creation story and God's wonderful world. EM Virtues Stewardship (9), Life choices (2), Ourselves (1), Freedom and Responsibility (8)
Key Concepts	Can describe the lifecycles of mammals, amphibians and insects using diagrams. Can describe similarities and differences between them.

Currently, the two terms used are substantive and disciplinary concepts. Ofsted have actively stated we do not need to use these terms but understanding the differences between them is important:

Please note, even where there are schemes in place, as a subject leader, we need to map out which lessons are being taught in which week. Please be aware of the number of weeks in each half term so that we do not over plan. You may wish to allocate a consolidation week.

Session	Key Vocab	Substantive Knowledge	Disciplinary Knowledge	Lesson Content Key Questions	Assessment opportunities
1	life cycle, live, young, fertilises, egg, runners, reproduce, sperm, metamorphosis gestation, cuttings, plantlets, bulb, sexual/ asexual reproduction	L.O: I can describe the differences in life cycles of a mammal, an amphibian, an insect and a bird.	WS I can use oral and written forms to report conclusions  SE: I can identify patterns that might be found in the natural environment 	Slide 1 introduce the topic Slide 2 an idea of pre assessments to do before starting the topic Slide 3- concept map- what do you think when you hear the words living things? Allow the children time to complete this activity. This can be done prior to starting the unit. Slide 4- record children's ideas of what they want to find out. Slide 5- discuss the learning which will take place during the topic Slide 6- introduce the objectives for the lesson Slide 7- introduce key vocabulary and display it in the classroom Slide 8- Watch the video to recap on classification of animals from Year 2 and 4 https://youtu.be/mRidGna-V4E Slide 9- Headband activity Children are given a card which they have on their head. They go around the classroom asking yes or no questions to find out what animal they are. Try and get them to ask questions such as do I lay eggs? Do I give birth to live young? Do I live in water? Try and discourage them from asking am I a reptile etc. Once you are happy that they have asked enough questions, tell them they can start to guess what they are- am I an elephant? Slide 10- Frog life cycle (use notes to help explain) 1. Adults lay hundreds of tiny eggs. This usually happens in early spring when the weather is just starting to get warmer. The eggs are usually laid among vegetation because they are defenceless. Frogs lay frogspawn which looks like a round cluster of eggs. Toads however lay toadspawn which looks like long ribbons. The baby amphibians start out as jelly-like dots surrounded by a jelly-like substance where the embryos grow.	Teacher TA support where needed. Address misconceptions.

				2. After 1-3 weeks the tadpoles eat the yolk of the egg and hatches. They have gills, a mouth and a long tail and they can swim. For the first couple of weeks, they won't move around very much as they are still absorbing nutrients from the yolk. However after this time, they will start to move further away. Unlike frogs, tadpoles can't go on land yet so they feed on vegetation in the water. The tadpoles slowly metamorphose into frogs/toads over the next 14 weeks. 3. They first start to grow legs. Then their bodies to start to change and they are now able to eat insects. The tail then starts to shrink away and skin grows over their gills as they develop lungs and ear drums. 4. Once the gills and tails have gone the tiny frogs can move out of the water. The process involving the change the frogs/toads go through is called metamorphosis. 5. The frogs /toads grow to be adults and the female frogs/toads look to lay eggs of their own. Slide 11-15 Photos and more information for the children to view Slide 16- children go back to their tables and look at other amphibian life cycles- can they spot any patterns? These can be recorded on post its. Slide 17- Go through the basic process of the life cycle of an amphibian- allow children time to talk about what they discovered. Slide 18- concept cartoon about mammals- allow the children time to talk to partners. Concept cartoon – who do you agree with and why? Most mammals give birth to live young (placentals). There are exceptions though- the duck-billed platypus and the spiny anteater do lay eggs and are known as monotremes. Marsupials are a type of mammal which are not fully formed when they are born and continue to develop inside a pouch on the females stomach. Examples include: kangaroos, koalas, wombats. Slide 19- TTYP consider common features of mammals – recap on prior knowledge Slide 20- go through these using feedback from children Slide 21- Discuss life cycle of mammals 1. A mammal starts out as an embryo and then grows into a foetus. Placental mammals continue to grow inside the mother's tummy until ready to be born. The baby is then born into the world and fed with the milk produced by the mum.	Assess what patterns the children can see. Lots of opportunities to address misconceptions

				2. The baby mammal grows from baby-child-adolescent to adult. 3. When a mammal reaches puberty they can have a baby of their own which most mammals do. Mammals then grow older and eventually die. Slides 22-31 More information for the children Slide 32- Discuss bird life cycle 1. The birds make a nest for their eggs. The mother lays her eggs in the nest. The parents sit on the eggs to keep them warm. This is known as incubation. When the embryos are ready to be born they break the egg and are born. 2. The birds are fed by their parents until they are big enough to leave the nest and find food for itself. 3. The independent adults find a partner and starts the cycle again. Slide 33- modelled by the teacher watch the video and discuss what is happening at each stage. Then children do the same. Teacher pause the video at key points and the children discuss what is happening. Alternate the person talking in pairs o that there are all have a go. Slide 34-41 More information about bird life cycles Slide 42- children draw one of the lifecycles discussed in the lesson and add detail to the life cycles. Slide 43- children self-assess on their front page against LO and vocabulary. Children tick the SE and WS covered.	Use WS assessment in resources Children discuss each stage of the video- address misconceptions
2	life cycle, live, young, fertilises, egg, runners, reproduce, sperm, metamorphosis gestation, cuttings, plantlets, bulb, sexual/asexua	L.O: I can describe the differences in life cycles of a mammal, an amphibian, an insect and a bird.	W.S I can present data in a variety of different ways to help answer my questions  S.E. I can sort and classify different life cycles to identify	Slide 44- Explorify activity. Odd one out. Get the children to discuss which is the odd one out and why. Encourage them to consider life cycles and how this is the odd one out e.g. the frog because it lays eggs in water. See notes on slide for more information about the animals. Slide 45- introduce today's learning objectives Slide 46- Watch the video on life cycles from BBC teach. https://www.bbc.co.uk/teach/class-clips-video/science-ks2--ks3-the-life-cycles-of-different-organisms/zvh8qp3 The video should be hyperlinked so needs to be clicked on but the link is also in the notes bar. This is to remind children of previous learning and introduce the metamorphosis life cycle of the butterfly. Slide 47- recap over the butterfly life cycle.	**Address misconceptions**

	l reproduction		similarities and differences. 	1. Adult female butterflies lay eggs after mating. They try and hide these eggs to stop them being eaten. 2. The eggs hatch into tiny larvae which in this case are caterpillars. The caterpillars feed on leaves and continue to grow. They can grow up to 100 times bigger during this stage. As the caterpillar grows it can split its skin and shed 4-5 times. When the caterpillar is fully grown, it stops eating and becomes a pupa. Some species hang upside down. This stage can last for a few weeks. 3. The pupa, in this case a chrysalis, forms where it undergoes complete metamorphosis to emerge as a butterfly. It might look from the outside like nothing is happening but big changes are happening inside. Special cells in the larva are growing into legs, wings, eyes and other parts of the butterfly. 4. The adult butterfly finds a mate and the female lays more eggs. Adult butterflies only live 1-2 weeks but some species hibernate and can survive for several months. Slide 54- Watch the video and stop it at key points. Ask the children what is happening. Encourage them to use key scientific vocabulary Slide 55- Children to act out each stage of the butterfly life cycle Slide 56- Consider how this differs from other insects who don't go through complete metamorphosis. Examples: 1. Complete metamorphosis- butterflies, moths, beetles, flies and bees 2. Incomplete metamorphosis- grasshoppers, crickets, dragonflies, cockroaches A grasshoppers metamorphosis is incomplete because it doesn't turn into a caterpillar, inside it is born as a small version of the adult self called a nymph. Slide 57- Children talk through and discuss each life cycle in pairs, small groups. Introduce how to compare life cycles of different animals Encourage the children to come up with more ideas Slide 58- Share slide 58 with children. Children to compare the life cycles of different animals based on her own research and that of other children . Vocab mat can be placed on tables. Worksheet can be downloaded from resources. Slide 59- children self-assess cover page.	**Children verbalise what is happening at each stage. Address misconceptions.** **Address misconceptions**

3	life cycle, live, young, fertilises, egg, runners, reproduce, sperm, metamorphosis gestation, cuttings, plantlets, bulb, sexual/asexual reproduction	**L.O: Describe the life process of reproduction in some plants and animals.**	WS I can ask relevant questions and find ways to answer them.  S.E. I can independently use secondary sources to research the work of naturalists and animal behaviourists. 	Slide 60- Children have a go to revise their previous learning. There is a printable sheet for this or you can display on the board and they can discuss. Slide 61- answers to go through to check for understanding. Slide 62- Go through lesson objectives. Slide 63- Discuss information on the slide. Allow children time to think about the content and discuss as a class. Introduce children to different scientists. Slide 64- Click on the picture to watch the clip about Jane Goodall and the work she has done. Slide 65- Read slide to children. Ask children to choose an animal and write down (or tell a friend) everything they know about an animal. Discuss how they know this? How do scientists know about these animals? Children chose an animal that they want to research and observe. Encourage children to choose an endangered animal such as tigers, gorillas, orangutans, turtles, rhinos, blue whales. Snow leopard, pandas, polar bears, elephants. Children record their animals and any questions they might have about the animal. Slide 66- Children go and research their chosen animal and make a poster about them. They may want to copy the grid on the screen to support them. You may choose to give them some research books which you can get from local library services or print information or allow them time to research on the internet. A good website to use with printables: https://www.worldwildlife.org/species/directory?direction=asc&page=2&sort=extinction_status Slide 67- Share the slide about what Jane noticed with her research. Slide 68- click on the picture to share the work of David Attenborough. (5 mins) Slide 69- Children self-assess against the learning objectives.	Adress misconceptions Questioning Look at questions to see if they are suitable for the children to answer. You can do this as a mini plenary
4	life cycle, live, young, fertilises, egg, runners, reproduce, sperm,	L.O: I can describe the life process of reproduction in some	W.S. I can make accurate and relevant predictions	Slide 70- allow the children time to discuss what they learnt about pollination in Year 3 during their plants module. If you have real flowers in the classroom, children can use these to support them. allow the children time to discuss what they learnt about pollination in Year 3 during their plants module. If you have real flowers in the classroom, children can use these to support them. Slide 71- Share lesson objectives for the session.	Assessment opportunity to know your starting point for this lesson.

	metamorphosis gestation, cuttings, plantlets, bulb, sexual/asexual reproduction	plants and animals	 S.E. I can report and present my findings from research 	Slide 72- Watch video about pollination Slide 73- What is the difference between pollination and fertilisation. TTYP watch the clip. Slide 74- Pollination is an essential part of plant reproduction. Pollen from a flower's anthers (the male part of the plant) rubs or drops onto the pollinator. The pollinator then takes the pollen to another flower, where the pollen sticks to the stigma (the female part). The fertilized flower later yields fruit and seeds. Slide 75- Role play with the children. Talk through each step (below) and the children can act out pollination. One person is the bee, one is the first flower and one is the second flower. 1. The bee goes to the flower. The flower smells nice and is bright coloured to attract the bee. 2. The bee collects nectar from the plant and the pollen from the anther gets stuck on the bee (flower one can stick pollen to the bee – sticky tape would work well). 3. The bee flies to another flower and some of the pollen sticks to the female part of the plant (bee can stick the pollen on flower 2). Slide 76-78 Go through slides Slide 79- Explain that some plants are pollinated by wind. Go through the slide. Try to encourage children to notice that these types of plants don't have a strong smell and don't have bright flowers because they do not need to attract pollinators. Slide 80- Read slide Slide 81 children go and find some moss around school and bring some back to class. Alternatively, moss can be brought into the classroom by the teacher. Slide 82: Children look through magnifying glass to see hook shaped spores. Slide 83- Go through information Slide 84-88 Go through information https://youtu.be/CvcZOI-3y1E to share about tubers if needed Slide 89- Allow children time to predict how each plant reproduces. Have poster of mint, crocus, sweet potato and daisy in 4 areas of the classroom. Encourage language of sexual and asexual reproduction, tubers, rubbers, bulbs etc. Children record their predictions in their books, children can refer back to their prediction at the end of the lesson. (This is an assessed piece) Children can use the STEM sentences on the slide to support their predictions. Ask them to justify their choices using scientific understanding.	Questioning Assess children's predicting skills by viewing their post its and asking them to justify their thinking.

				Slide 90- children find out more about two plants they choose and write these in their books with a picture using correct scientific vocabulary. Provide children with sources for their research including books, internet etc Slide 91- Self assess against lesson objectives and vocabulary.	
5	life cycle, live, young, fertilises, egg, runners, reproduce, sperm, metamorphosis gestation, cuttings, plantlets, bulb, sexual/asexual reproduction	L.O: I can describe the life process of reproduction in some plants and animals	W.S. I can suggest next steps based on the weakest aspects of my enquiry  S.E.I can present my findings including explanations in oral and written forms. 	**For this lesson, I suggest splitting into two parts. The first part where the children will decide on their question and the second where they actually carry out the investigation, so you have time to collect equipment and plants needed.** Slide 92- Allow the children time to discuss what they can remember about pollination. Ensure children use the correct vocabulary. Slide 93- get the children to discuss the plants and how they reproduce linking back to last lesson. Slide 94- Introduce learning objectives Slide 95- introduce the big question- can I grow new plants from different parts of the parent plant? Ask the children to discuss what they think. Slide 96- Introduce some questions which the children could investigate but the encourage them to consider their own too. Children need to be put in groups to decide on a question. Slide 97- Discuss fair testing. If you are not sure about this, click here: https://www.ogdentrust.com/assets/general/WS-fair-tests_February-2020.pdf Slide 98- Encourage the children to research about their method. For example: how to grow vegetable tops or how to grow moss spores. Children then consider equipment they might need for their investigation. It would be useful for you to speak to groups individually to make sure they have everything they need. Slide 99- Children use planning boards to decide on their investigation. This can be done in groups as this is not the assessment point of the lesson. https://youtu.be/fCf-eS77mVE (use this if you are not sure how they work) Slide 100- I suggest this is where the second part of the lesson starts. The children set up their investigation and this will continue over time. Slide 101- Evaluation. This will be completed at the end of the investigation. Model how to write an effective evaluation using the questions as a stimulus. Children write these in their books on the LO sheet. This is the assessed piece of the lesson. Use WS assessment.	Assess the use of scientific language Questioning Assess knowledge of fair testing to know how much time needs to be spent on this area. If children are unfamiliar with planning boards then you will need to go through this and model how they are used.

				Slide 102- Children self-assess against LO and vocabulary using the unit title page. Slide 103- Optional home learning task. Go through the slide.	Mark their evaluations and assess using the WS assessment boxes on the LO sheet
6	life cycle, live, young, fertilises, egg, runners, reproduce, sperm, metamorphosis gestation, cuttings, plantlets, bulb, sexual/asexual reproduction	LO I can describe the life process of reproduction in some plants and animals	W.S. I can record my results using a bar chart and can explain the results  S.E. I can look for patterns when considering gestation periods of animals 	Slide 103- start here again and discuss home learning task. Slide 104- Introduce today's objectives Slide 105-115 Go through the slides Slide 116- Introduce the big question. Are all animals pregnant for the same amount of time? Slide 117- Introduce the task where the children need to find out gestation periods of different animals. Slide 118-119 some examples. Children go off and find their gestation periods and feedback. Slide 120- record the different animals and their gestation periods on the whiteboard and model how to represent this in a graph. You can choose a graph which is relevant to the children in your class and what they need to work on. (Grid of gestation periods can be found in resources) Slide 121- Ask the children to discuss their findings. Ensure they have looked for patterns such as the ones on the slide. Slide 122- Self assess against the front page for the final time. Slide 123- Children add to their original mind map in a different colour to show their progression.	Assessment of learning from homework Ensure children know what a gestation period is. Summative assessment of what children have learnt
	Additional lesson			Life cycles – as part of the children's learning it is very important for the children to experience as much as possible in real life. I suggest bringing something in the classroom or using the school grounds to engage with life cycles. Examples: hatching fertilized chicken eggs, butterflies, frogs in a pond, using a camera in a bird box etc.	