

YEAR 5 UNIT 3: Circle of Life (Living things and their habitats)

Enquiry Question: How do life cycles vary?

Related units:

Year 4 Unit 2: How are animals grouped?

Year 5 unit 1: How are living things classified and why?

Unit overview

National Curriculum Links Year 5: Living things and their habitats.

Children will describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. They will describe the life process of reproduction in some plants and animals. This builds on children's knowledge in Year 2 when they find out that animals have offspring that grow into adults. Year 3 when they learnt about the structure of flowers and how they relate to reproduction and the process of pollination. It also builds on knowledge from Year 4 when children recognised that living things can be grouped in a variety of ways and how their habitat changes throughout the year. Children will raise questions about their local environment throughout the year. They will observe live cycle changes. They will find out about different types of reproduction, sexual and asexual in plants and sexual in animals.

Scientific vocabulary

- bulb
- pollination
- fertilisation
- sexual reproduction
- asexual reproduction
- larva
- gestation
- metamorphosis
- sperm
- internal fertilisation
- external fertilisation
- stigma
- style
- vegetative propagation

Working Scientifically

1. Making new plants

Planning different types of enquiries to answer questions, including recognising and controlling variables where necessary

2. Metamorphosis

(Describe the differences in the life cycles of an insect and a frog.)

Planning different types of enquiries to answer questions researching using secondary sources.

3. Taking plant cuttings

Recording data and results using a range of scientific equipment, reporting and presenting findings, including conclusions, causal relationships

4. What came first?

Planning different types of enquiries to answer questions researching using secondary sources.

5. Finding a mate

Describe the process of reproduction in some animals.

6. Endangered animals

To know about the life and work of a scientist – Jane Goodall (not statutory)

Assessment

Assessment:

1. Describe the differences in the life cycles of 2 different animals
2. Describe the process of reproduction in 2 animals
3. Explain how plants reproduce
4. Explain how new plants can be grown (from cuttings and bulbs)

Cross-curricular links

English:

- Write an instructional text for how plants grow.

Maths:

- Draw a graph to show the growth rate of plants

Teacher knowledge

Flowers are the reproductive organs of a plant. They produce pollen and eggs, which then produce seeds. In sexual reproduction, the male parts of the flower produce pollen and the female parts produce ova, or eggs. Both pollen and eggs contain half the genetic information necessary to make a new plant, in the same way that sperm and eggs do in animals. Plants cannot pollinate their own flowers: they need to get their pollen to the flowers of another plant. Often the pollen is carried by insects, but it can also be dispersed into the wind. When pollen lands on the stigma of another flower, it joins with the egg and their DNA combines. The egg is now fertilized. This will happen many times with all the eggs in the ovary.

All animals grow from an egg. In insects, fish and amphibians, this egg is a ball of jelly and the baby develops inside. Birds and reptiles lay larger eggs with a shell. Birds' eggs have hard shells and reptiles have leather shells. The baby develops inside and then hatches when it is ready to come out. Mammals do start as a tiny egg, but this egg stays inside the mother in a special area called the womb. The baby is known as an embryo. The baby is joined to the mother by a placenta, and it gets food and oxygen that way. Once the baby is developed enough, it is ready to be born.

Many animals, including amphibians and insects, have a distinct juvenile form, which looks very different from their adult form. This larval stage then undergoes a process of metamorphosis where it loses some features and gains new ones: e.g. a tadpole will lose its gills and tail and grow legs. Larvae may live in different environments such as underground or in water, and may eat different foods. Some animals will spend most of their lives in a larval stage, becoming adults only to breed and produce eggs, after which they die.

Fertilisation occurs when a single sperm fuses with a single egg. The genetic information of the two cells combines to produce an embryo, which then develops further, usually within an egg or in the case of mammals inside the mother's womb.

Many animals release thousands of eggs and millions of sperm (Especially into the water) at a time. The large numbers increase the chances of a sperm meeting an egg, especially in animals where the male and the female may not spend much time in physical proximity. The eggs are abandoned by the parents and the young left to fend for themselves. Many of the offspring will be eaten or die, so many babies are needed to make sure just a few make it to adulthood to produce more offspring.

In mammals and birds, the eggs are kept inside the female and fertilised with sperm from the male. Fewer eggs are needed since the chances of fertilisation are higher. There is also a higher level of parental care after the offspring are born and therefore a higher chance of survival, so the numbers of offspring are lower.

Did you know?

- Trees can live for a very long time. The oldest tree in the world is a Great Basin bristlecone pine in California, which is thought to be over 5000 years old.
- Butterflies can taste with their feet. This lets them tell whether the leaves they stand on will make good food for caterpillars.
- The cicada is an insect that spends 17 years underground as a larva. Millions emerge as adults on the same day. They breed, laying eggs that will stay underground for another 17 years.
- Some aphids are born pregnant.
- 99% of all the animal and plant species that have ever lived on this planet have become extinct.

Misconceptions:

- Children might not think that sex is something plants do, or that it takes two plants to produce seeds to make a new plant.
- Children may not know that it is possible to make new plants by growing runners or through taking cuttings.
- Children might think that the life cycle begins at the baby/larval stage when in fact it begins at the egg stage (or embryo in mammals)
- Children might think that a sperm or egg contains a tiny baby inside it and that fertilisation causes it to start growing. In fact, sperm and eggs each contain half the genetic information needed to make a whole new animal.

Resources

Life cycle of a dandelion: www.youtube.com/watch?v=UQ_QgtXoyQw

Methuselah plant: news.nationalgeographic.com/news/2008/06/080612-oldest-tree.html

Science and plants for schools: www.saps.org.uk/primary/teaching-resources/553-sequencingthe-life-cycle-of-plants

One year in 40 seconds: www.youtube.com/watch?v=lmIFXIXQQ_E

Frogs: www.outube.com/watch?v=_MupYQMAaKA