



Year 6 - Reproduction - Reading Booklet

Lesson Series:

1. Asexual reproduction
2. Sexual reproduction in flowering plants
3. Seeds in fruits
4. Reproduction in animals
5. Growth stages

Name: _____

Class: _____

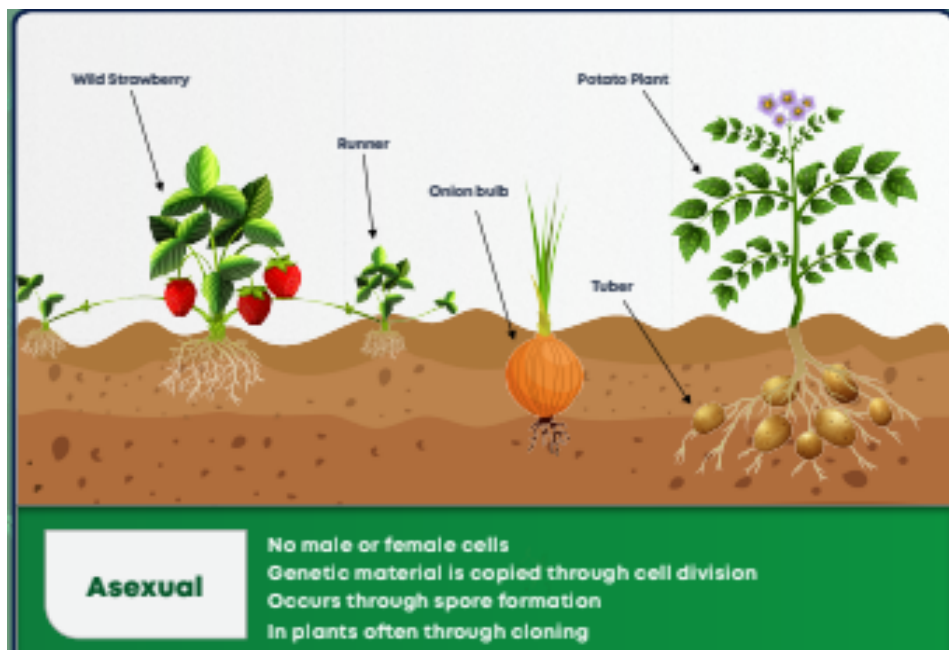
Lesson 1 - Asexual reproduction

All living things are born, grow and eventually die. To keep from dying out, all living things reproduce themselves, 'Reproduce' means 'to make again' or 'to make a copy'. The cells in your body reproduce themselves and increase in number, which is how you grow. Every day, for example, some of your skin cells reproduce themselves and some of them die. As you grow bigger, your skin cells reproduce faster than they die, so your skin can continue to cover your whole body. As you grow taller, cells in your bones reproduce and make longer, thicker bones. When you become an adult, cells reproduce more slowly so that at about age twenty you stop growing bigger. From then on, cells are created at about the rate they die, so the number of cells stays about constant.



Organisms reproduce in different ways. One way is through asexual reproduction. Asexual means 'non-sexual' that is reproduction without using males and females. The organism simply copies itself through cell division. Asexual reproduction can be very simple. Bacteria and many protists reproduce by splitting. After making copies of their genetic material, bacteria simply split their single cell in half. Each half becomes a new cell. Some plants and some animals can reproduce asexually. Some plants naturally clone themselves, like strawberries which send out 'runners' or daffodil bulbs that divide into two underground. Only simple animals like sponges, flatworms and jellyfish reproduce asexually. Some just split in two and some grow a new smaller copy on their side that eventually falls off.

Useful link: <https://www.bbc.co.uk/bitesize/guides/zykp34j/revision/1>



Lesson 2 - Sexual reproduction in flowering plants

In flowering plants, male and female reproductive structures can be found in the same individual plant. The organ of sexual reproduction is the flower. Male gametes are found in pollen grains and produced in the anthers of the flower. Female gametes are found in ovules and produced in the ovary of the flower.

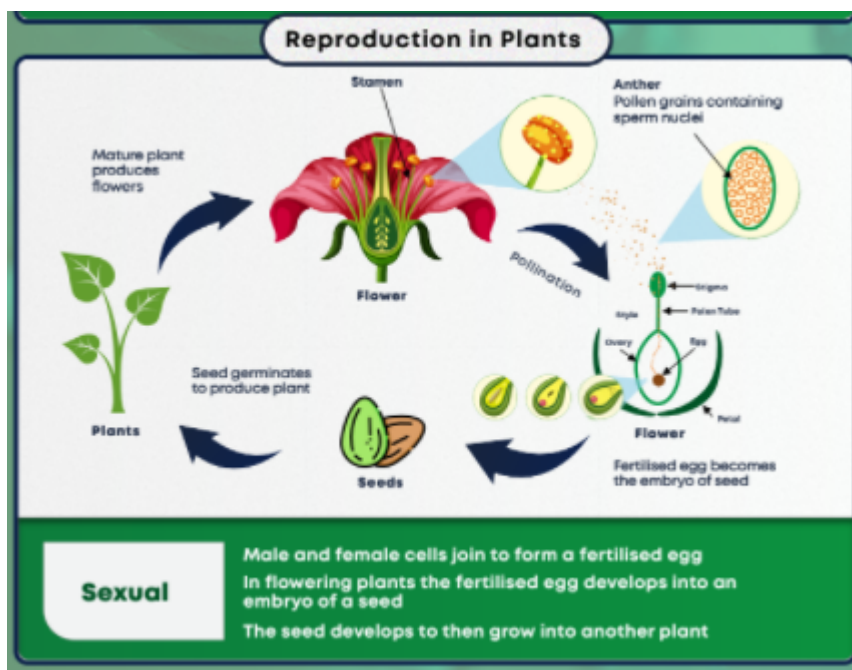
Read this

Pollination is the transfer of pollen grains from an anther to a stigma. Pollen can be transferred by an animal or by the wind. Fertilisation takes place inside the ovary when the nucleus of pollen grain fuses with the nucleus of an ovule to produce a zygote.

Step one: After pollen has landed on the stigma, it grows a pollen tube down through the style to the ovary.

Step two: The nucleus of the pollen grain travels down the pollen tube and fertilises the nucleus in the ovule.

Step three: The fertilised ovule develops into a seed. The seed contains the plant embryo, which contains genetic material from both parents. The ovary develops into the fruit.



Useful links: <https://www.bbc.co.uk/bitesize/guides/zykp34j/revision/4>

<https://www.bbc.co.uk/bitesize/topics/zgssgk7/articles/zyv3jty>

<https://www.bbc.co.uk/teach/class-clips-video/science-ks2--ks3-how-plants-and-animals-reproduce/zm8fbdm>

Lesson 3 - Seeds in fruits

Many plants produce fruit. After pollination, the egg inside the plant ovary is fertilised and becomes a seed. This seed is the key to the plant being able to reproduce. If that seed can survive, and locate itself somewhere suitable, it will be able to grow into a plant.



Many plants cover their seeds with fruit. This creates a covering to protect the seed, but also in some cases helps attract animals who disperse the seeds. The 'Aardvark Cucumber' and the Aardvark have a symbiotic relationship. This means the two living things interact and this interaction benefits both of them. The Aardvark eats the Aardvark Cucumber for its moisture, the seeds pass through the animal who then buries its dung under the ground. This 'plants' the seeds, which then can germinate and grow. The Aardvark benefits, and so does the cucumber plant.

If the fruit of a plant is attractive to animals, then the animals can help to spread the seeds, ensuring survival of the plant species. Scientists, particularly botanists, call the skin of a fruit; exocarp. Exo, meaning on the outside and carp, from the Ancient Greek word Karpos meaning fruit.

The fleshy part of the fruit is called the mesocarp. The mesocarp is rich in vitamins and attracts animals to the fruit, which helps with dispersal. The endocarp, endo meaning within, is the part of the fruit that surrounds the seeds. In stone fruit, such as peaches and cherries, the endocarp is inedible, animals discard this part and disperse the seeds. The endocarp protects the seeds until they are ready to germinate.

Useful link: https://en.wikipedia.org/wiki/Fruit_anatomy#/media/File:Drupe_fruit_diagram-en.svg



Lesson 4 - Reproduction in animals

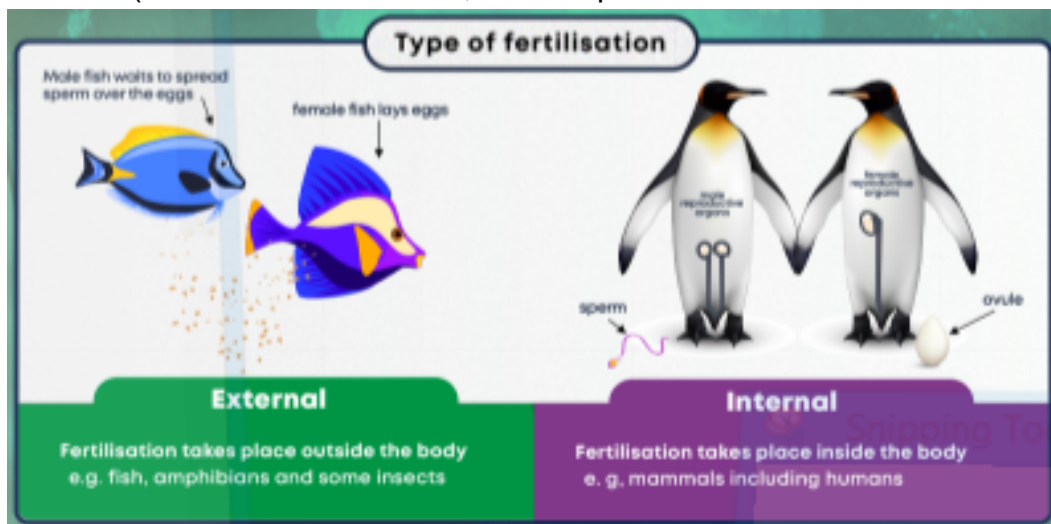
Almost every animal uses sexual reproduction to produce offspring. Male and female cells combine to form a single cell - this is called fertilisation. Offspring produced sexually have 2 parents, so although they resemble the parents, they are not necessarily identical to them.

Read this

Whilst sexual reproduction is common to most animal species, the way it is achieved varies. Most importantly, fertilisation can happen outside the female body or inside: External Fertilisation -Fertilisation in many animals that live in water takes place outside the female's body (most amphibians and fish, some invertebrates). Most fish produce a large number of sex cells; the sperm and eggs are released into the water near each other and some are fertilised. There are many hazards: the sperm and egg may not meet; they may be eaten by predators or they may die due to environmental conditions e.g. temperature. As the chances of fertilisation are low, huge numbers of sperm and eggs are needed to make sure enough young are produced.

For most animals which live on land (and some aquatic animals), offspring are fertilised inside the female's body. Internal fertilisation has the big advantage that the fertilised egg is protected from harsh environments and predators. Fewer offspring are produced than with external fertilisation, but survival rates are much higher. There are 3 ways that internal fertilisation can happen:

- 1) The egg is fertilised inside the female's body. The young develop within the female, receiving nourishment from the mother's blood through the placenta and offspring are born alive (this includes almost all mammals).
- 2) The egg is fertilised inside the female's body. The fertilised egg is then laid outside the female's body and develops there until ready to hatch, receiving nourishment from the yolk of the egg (this includes all birds).
- 3) Fertilised eggs are held within the female where the offspring develop, receiving nourishment from the yolk of the egg. The eggs hatch as they are laid, making it resemble live birth (this includes some fish, some reptiles and some invertebrate animals).



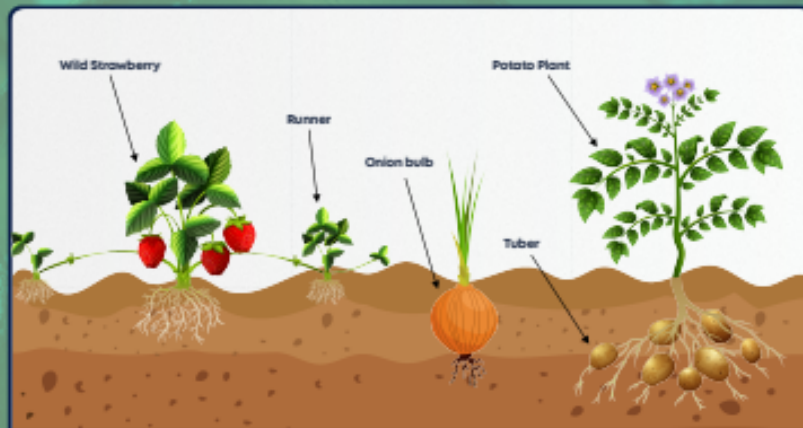
Lesson 5 - Growth stages

Different species have different ways of looking after their young. Fish do not take care of their young at all. Nor do sea turtles. Female sea turtles lay 50 to 100 eggs in a hole in the sand and then return to the ocean. Their young hatch, crawl out of their nest and crawl to the sea with no protection or help from their mothers. Before reaching the ocean that are often eaten by hungry gulls or crabs. If they do reach the water, they may be swallowed by hungry fish. But because the sea turtle lays so many eggs, there is a chance some of them will survive.



Other new-born animals are cared for by one or more parents until they can survive on their own. Usually, birds tend their young until they are old enough to fly. Lion cubs stay with their parents for about four years, until they are old enough to defend themselves and to find food. Humans stay with their parents even longer.

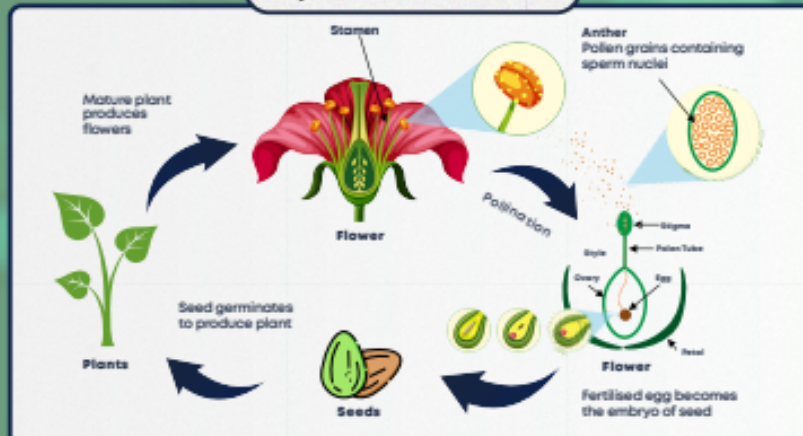
The development of an organism from birth through reproduction to death is called the life cycle. Usually there are noticeable stages of development during an organism's life cycle. During the life cycle of a horse, reproduction occurs inside the mother when the egg and sperm unite and an embryo develops. The embryo grows into a foetus, which looks like almost like a full-grown horse in miniature. Soon after birth, when it can stand, the young foal drinks milk from its mother's teat. After a year, the foal no longer needs his mother's milk and eats grass beside her. In four years it is a mature horse.



Asexual

No male or female cells
Genetic material is copied through cell division
Occurs through spore formation
In plants often through cloning

Reproduction in Plants



Sexual

Male and female cells join to form a fertilised egg
In flowering plants the fertilised egg develops into an embryo of a seed
The seed develops to then grow into another plant



Reproduction

Asexual reproduction

Sexual reproduction

Germinate

Pollination

Fertilisation

Foetus

Gestation

Process of copying or making a copy, in animals reproduction **creates offspring**

Form of reproduction where **offspring come from one living organism**

Production of new organisms by **combining of genetic information** from a male and female cells

Stage where a living thing starts to **sprout, grow and develop**

Process when pollen moves from the male part of a flower (anther) to the female part of a flower (stigma)

Male and female **gametes join to make a new organism**

Unborn offspring

The **period of development** before birth

Type of fertilisation

Male fish waits to spread sperm over the eggs



External

Fertilisation takes place outside the body
e.g. fish, amphibians and some insects

female fish lays eggs



Internal

Fertilisation takes place inside the body
e.g. mammals including humans