BIOLOGY Bioenergetics 1 – Knowledge Organiser Y7 KS3

Plant reproduction	Pollination and fertilisation 1	Pollination and fertilization 2	Germination	Seed dispersal	Food chains, food webs and disrupting food webs	Interdependence and predator-prey cycles	Sampling investigation	Bioaccumulation

Key Words

Key Word	Definition
Reproduction	The production of offspring
Pollination	The transfer of pollen to an egg
Fertilsiation	The fusing of the nucleus of pollen with the nucleus of an egg
Germination	The process of a seed stating to grow roots and shoots
Dispersal	The process of spreading seeds over an area
Independence	Two or more organisms depending on each other for survival
Predator	An animal that hunts and kills another animal for food
Prey	An animal that is hunted and killed for food
Bioaccumulation	How a toxic substance builds up inside living organisms

Misconceptions

- Plants can reproduce using pollen and eggs (sexually) but also by without pollen and eggs (asexually)
- That plants can pollinate themselves, most plants need the help of insects, wind or water for pollination to happen
- That plants produce fruits then seeds. Plants actually produce seeds first, then fruits to protect/disperse seeds
- The arrows in a food chain/web show what eats what, rather than the energy transfer
- That during bioaccumulation the toxic substance builds-up in the food chain, meaning the top predator has the most.

Key questions

- What structures does a plant have that allows it to reproduce?
- How does pollination and fertilisation in plants occur?
- What does it mean when a plant germinates?
- How are a plant's seeds dispersed?
- What does interdependence mean?

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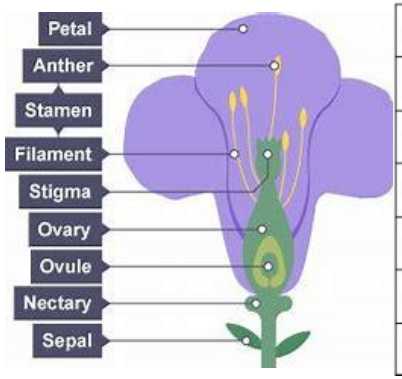
Plant reproduction

Some plants produce flowers. Within the flower there is an anther, that produces the pollen and an ovary, where the eggs are made.



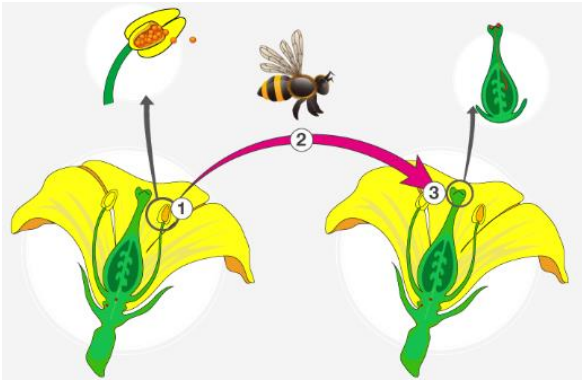
sepal	Protects the flower bud
petal	Colourful and attracts insects
filament	Holds up the anther
anther	Produces pollen
stigma	Sticky to catch grains of pollen
style	Holds up the stigma
ovary	Contains ovules/eggs

Pollination and fertilisation

Insects, along with wind and water transfer pollen to an egg. This is known as pollination.

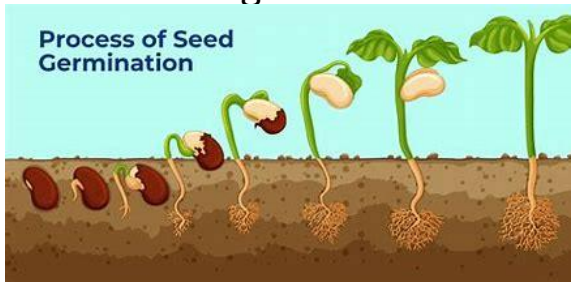
Insect pollination is very important for human food security. However, human activity has greatly reduced the number of pollinators e.g. bees which is causing issues with human food supplies..

Plants reproduce sexually to produce seeds, which are formed following fertilisation in the ovary. This is when a pollen cell nucleus fuses with an egg cell nucleus.



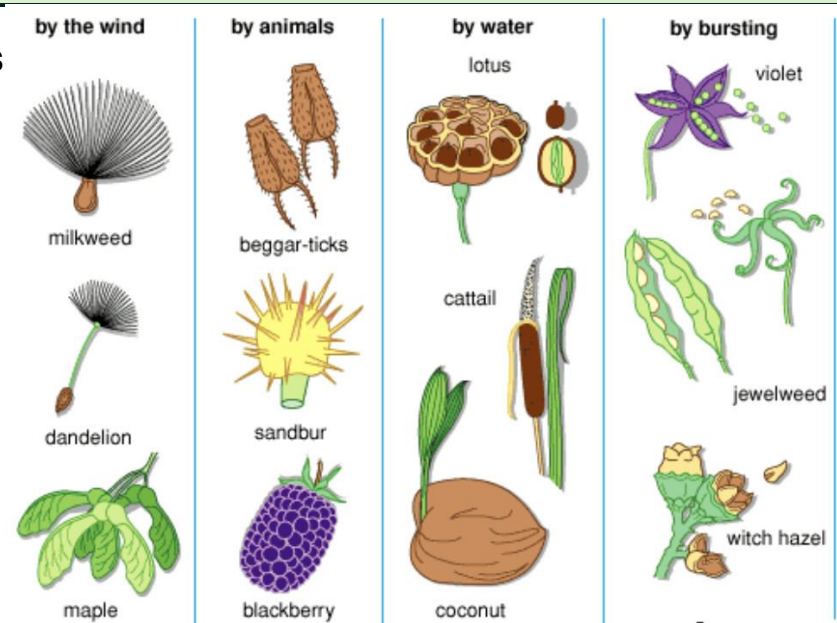
Germination

Germination is when plants start to grow roots and shoots.
Roots starts to grow downwards to absorb water and minerals.
Shoots start to grow upwards towards sunlight and so the leaves can take in carbon dioxide..
Water, carbon dioxide and sunlight are all needed for photosynthesis.



Seed dispersal

Plants have adaptations to disperse seeds using wind, water, animals or by bursting.
Seed dispersal is important to survival of the parent plant, as once a seed is dispersed it can germinate and produce a new plant (offspring).



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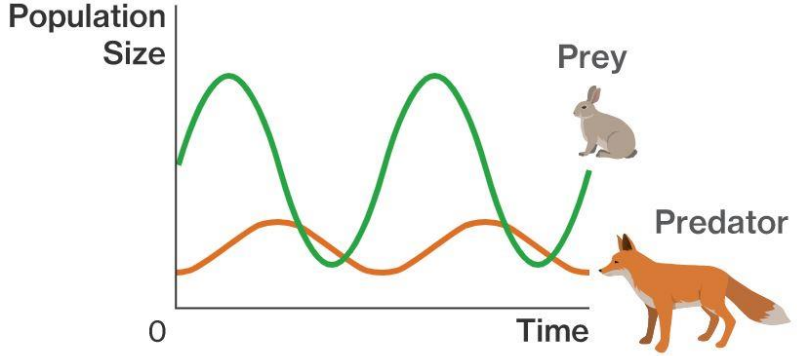
Food chains and food webs

- **Food chains** show the flow of energy from one organism to another.
- **Food chains** show the feeding relationships between organisms.
- **Food webs** show that most organisms consume or are consumed by more than one species.

Interdependence and Predator-prey cycle

Organisms in a food web (decomposers, producers and consumers) depend on each other for nutrients. So, a change in one population leads to changes in others.

The population of a species is affected by the number of its predators and prey, disease, pollution and competition between individuals for limited resources such as water and nutrients.



Sampling investigation

Quadrats are square frames which can be used to sample plants or slow-moving animals.

Most sampling using quadrats is random to avoid bias in your results.

Classification keys can be used to identify different species.

The results of ecological sampling can be used to inform conservation and preservation efforts to help protect species.

Bioaccumulation

Organisms are affected by, their environment, including the accumulation of toxic materials.

Bioaccumulation occurs when **toxins build up - or accumulate - in a food chain**. The animals at the top of the food chain are affected most severely. A build-up (bioaccumulation) of toxic substances can decrease species' population.