The plant kingdom

Organisms are **classified** into groups. The plant kingdom contains organisms that have green leaves, cell walls made of cellulose and can **photosynthesise**. Kingdoms are subdivided into smaller and smaller groups. The last two of these are the **genus** and the **species**. The names of these two groups are used to give each species a two-word scientific name.

Biodiversity

The range of species in an area is called **biodiversity**. We should preserve biodiversity because:

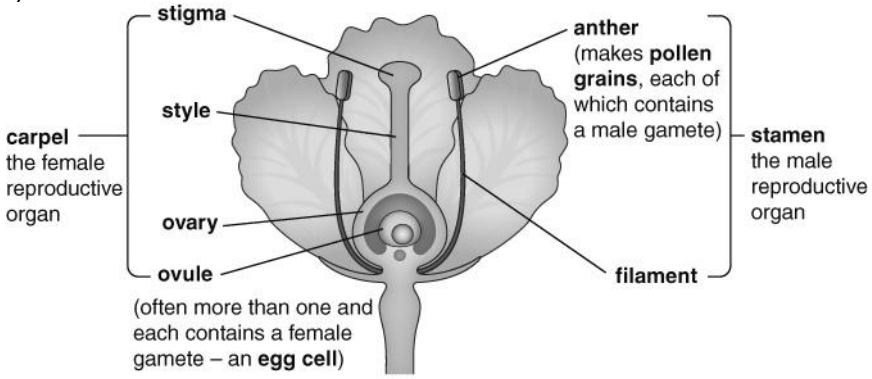
- organisms depend on one another (they are **interdependent**)
- we won't be able to make use of organisms if they become **extinct**
- more biodiverse areas recover better from natural disasters.

Sexual reproduction in plants

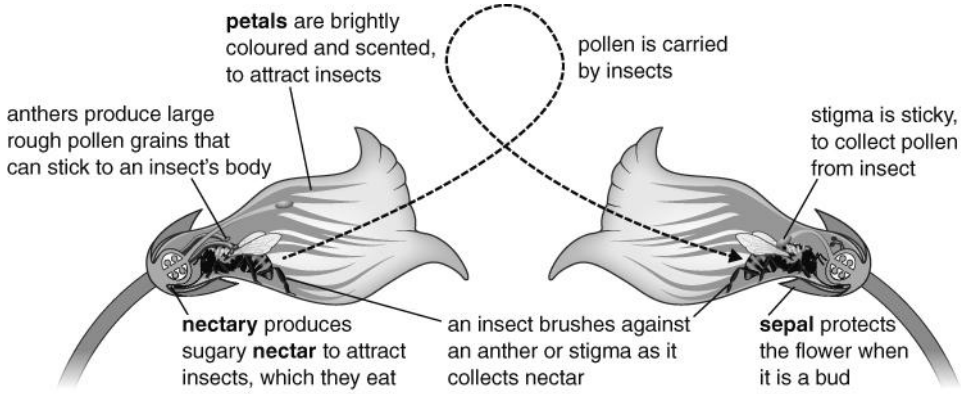
Reproduction produces new living things (**offspring**). **Sexual reproduction** needs two parents to produce **sex cells** or **gametes**. The gametes fuse to produce a **fertilised egg cell** or **zygote**. The zygote uses **cell division** to grow into an **embryo**, which can grow into an adult and become a parent (completing its **life cycle**).

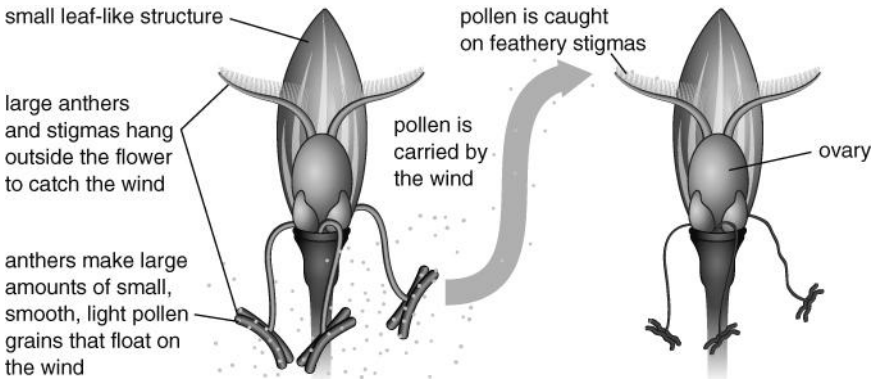
The offspring from sexual reproduction contain **characteristics** from both parents. The differences in these characteristics is **inherited variation**.

Gametes are produced by **reproductive organs**. In plants, these are contained inside **flowers**.

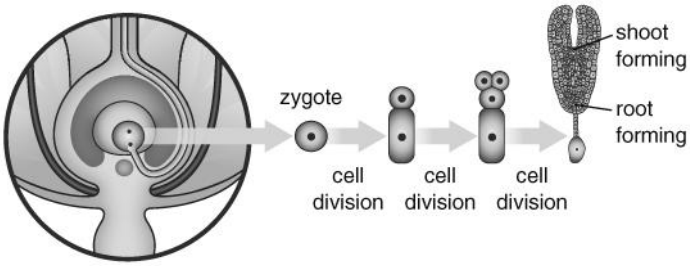


The **pollen grains** made in the anther need to be carried to the **stigma** of another flower. They are usually carried by insects or the wind. The carrying of pollen from an anther to a stigma is called **pollination**.





Once on the stigma, a pollen grain grows a **pollen tube,** which enters the **ovule** containing an **egg cell**. The nucleus from the male gamete inside the pollen grain joins with the nucleus inside the egg cell to form a zygote. This is called **fertilisation**. The zygote grows into an embryo and the ovule becomes a seed, containing the embryo and a food store.

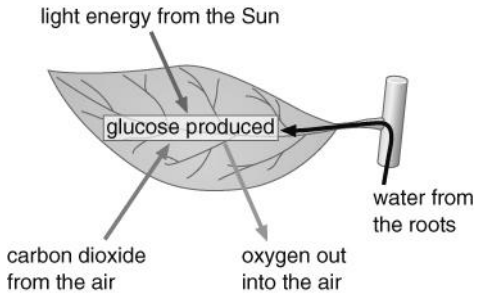


A part of the flower forms a **fruit**. This is used for **seed dispersal**, which stops the new plants competing with the parent plants for water, nutrients, light and space.

- Some fruits are eaten by animals and the seeds come out in their **faeces** (e.g. apples).
- Some fruits are carried on the fur of animals (e.g. burdock).
- Some fruits are carried by the wind (e.g. dandelion).
- Some fruits explode, scattering the seeds (e.g. lupins).

When conditions are right, seeds **germinate**. The **resources** needed are water, oxygen and warmth (WOW). Water allows chemical reactions to start, which break down the food store and allows cells in the embryo to swell up. Oxygen is needed for **respiration**, to release energy from the food store. Warmth is needed to speed up the chemical reactions.

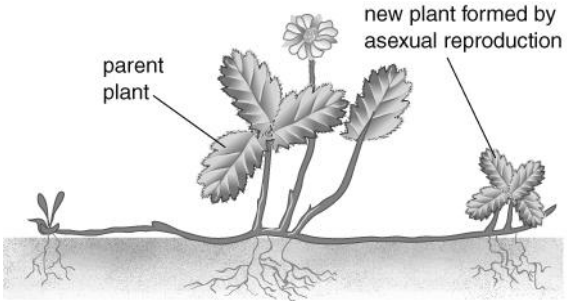
The root grows first then the shoot. Finally new leaves open and **photosynthesis** can start in the **chloroplasts**. The glucose from photosynthesis is turned into **starch** to be stored.



A growing plant needs light, air, water, warmth and nutrients called **mineral salts** (LAWWN).

Asexual reproduction in plants

Some plants can reproduce using **asexual reproduction**. This is when *one* parent plant is able to produce offspring (e.g. by using **runners** in strawberries or **tubers** in potatoes).



Accuracy, estimates and sampling

We can take a small sample of a larger population and use it to **estimate** what the larger population is like. Plant populations in an area can be estimated by taking samples using a **quadrat**. The more samples we take the more **accurate** the estimate is likely to be but the longer it will take to do.