

# Reproduction In Plants

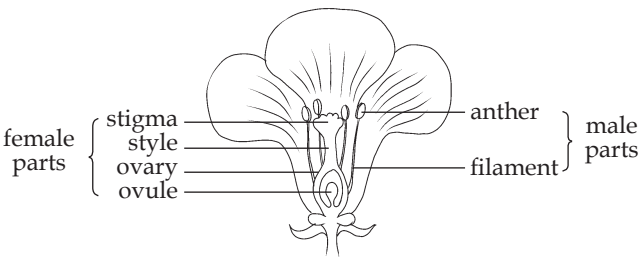
Living things reproduce to ensure that there will be members of their own kind left on earth after they die. In other words, living things reproduce to ensure continuity of their species.

## + Reproduction In Plants

- Plants can reproduce in different ways.
- Flowering plants bear flowers. They reproduce from **seeds**.
- Some non-flowering plants reproduce from **spores**.
- Plants can also reproduce from other plant parts.

## + Parts Of A Flower

- The petals of a flower are usually brightly coloured. This attracts insects to come to it and help in the pollination.
- The flower is made up of many different parts. Its most basic parts are divided into male and female parts.



Parts of a flower		Function
female parts	stigma	This is where the pollen grains enter as they travel downwards towards the style.
	style	The stalk which supports the stigma and holds it in a position which enables the pollen grains to enter the stigma.
	ovary	This is where the ovule is formed and once fertilization takes place, it will become the fruit.
	ovule	It contains an egg cell. The ovule will eventually develop into a seed.
male parts	anther	The place where pollen sacs are found. Pollen sacs produce pollen grains.
	filament	It is the stalk which supports the anther.

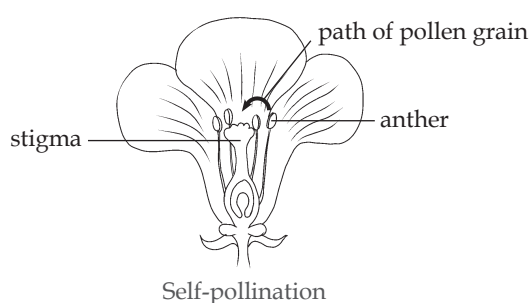
## Reproduction In Plants

A pollen grain (produced in the anther) is the male sex cell required for reproduction to take place.

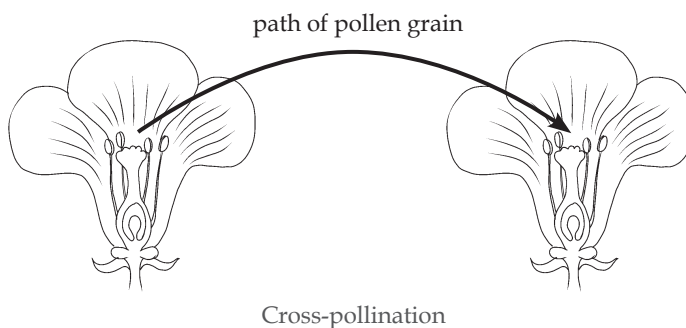
### + Pollination

**Pollination** is the process when pollen grains from the anther are transferred to the stigma of a flower of the same species.

If the pollen grains come from the same flower as the stigma, it is known as **self-pollination**. This can occur in flowers which have both male and female parts on the same flower.



If the pollen grains are transferred to the stigma of another flower, this is known as **cross-pollination**.



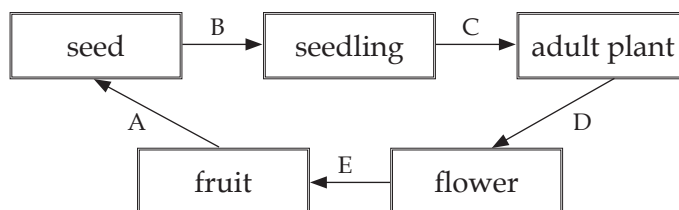
Most of the time, the process of pollination requires agents (organisms that assist in transferring the pollen grains to the stigma). There are three ways in which pollination can take place.

### ① Help Of Insects And Animals

Flowers can be pollinated by insects. The insects are attracted by the flower's petals, scent and sweet nectar. When the insect lands on the flower to feed on the nectar, the pollen sticks to its body. The pollen is deposited into the stigma of another flower when the insect lands on it. Birds and even some mammals such as bats can help in the pollination process in a similar way.

## Reproduction In Flowering Plants

1. Study the diagram shown below carefully.



Based on the diagram above, which statement is **not necessarily true**?

- (1) At B, germination takes place when there is sufficient air, water and warmth.
  - (2) At C, the seedling is able to make its own food as it develops additional leaves.
  - (3) At D, the adult plant produces flowers to attract insects to help in pollination.
  - (4) At E, fertilization takes place when the male cell fuses with the female egg cell. ( )
2. Kean conducted an experiment to show how overcrowding affects the growth of rose plants. He had some seeds belonging to the same rose plant and two identical pots of the same size. Which other variables should he keep the same in order to conduct a fair experiment?
- A. Number of seeds
  - B. Amount of soil
  - C. Amount of water
  - D. Location of pots
- (1) A and B only
  - (2) B and C only
  - (3) A, B and C only
  - (4) B, C and D only ( )
3. Study the characteristics of a seed shown below.

It is light and has a feathery structure attached to it which acts like a parachute.

Based on the above characteristics, how is the seed likely to be dispersed?

- (1) by wind
  - (2) by water
  - (3) by animals
  - (4) by splitting ( )
4. Which of the following statements about reproduction in flowering plants is **wrong**?
- (1) The male reproductive cell fuses with the egg cell found in the ovule.
  - (2) The pollen grains move down the style to reach the ovules.
  - (3) Fertilization takes place only after pollination.
  - (4) Pollen grains have a hard coat which protects the sperm cells. ( )

## Reproduction In Flowering Plants

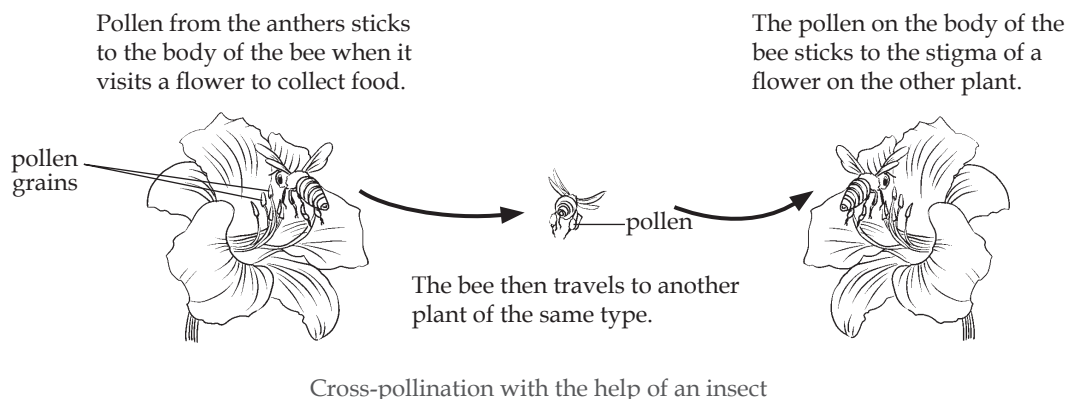
5. The table below shows the dispersal of some seeds of flowering plants.

Many seeds		One seed	
Dispersed by animals	Dispersed by splitting action	Dispersed by animals	Dispersed by splitting action
E	F	G	H

Which of the following statements is correct?

- (1) Both plants E and F have many seeds and are dispersed by animals.
- (2) Both plants F and H are dispersed by splitting action but Plant F has many seeds unlike Plant H.
- (3) Both plants E and G are dispersed by animals but Plant E has one seed unlike Plant G.
- (4) Both plants G and H have one seed each and are dispersed by splitting action. (     )

## Reproduction In Plants



Flowers that are pollinated by insects and other animals usually have brightly coloured petals, fragrant scents and produce nectar.

### ② By Wind

Some flowers are pollinated by wind. The pollen grains are carried by wind to be deposited in the stigma of another flower.

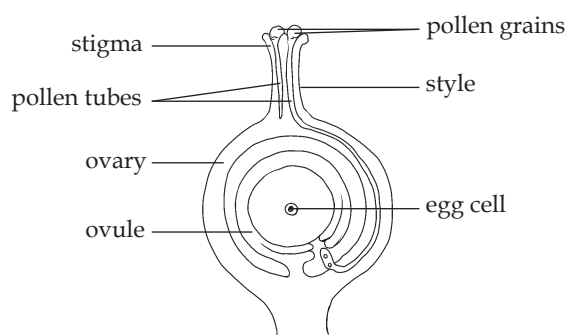
Flowers that are pollinated by wind have smaller, dull-coloured petals and are not fragrantly scented. An example of such a plant is the grass.

### ③ By Water

Some water plants are pollinated by water. The water carries the pollen grains to the stigma of another flower.

## + Fertilization

When the pollen grain lands on a stigma, it produces a tiny tube that grows down the style until it reaches the ovule.



The tiny tube formed from the pollen grain travels down to the ovule.

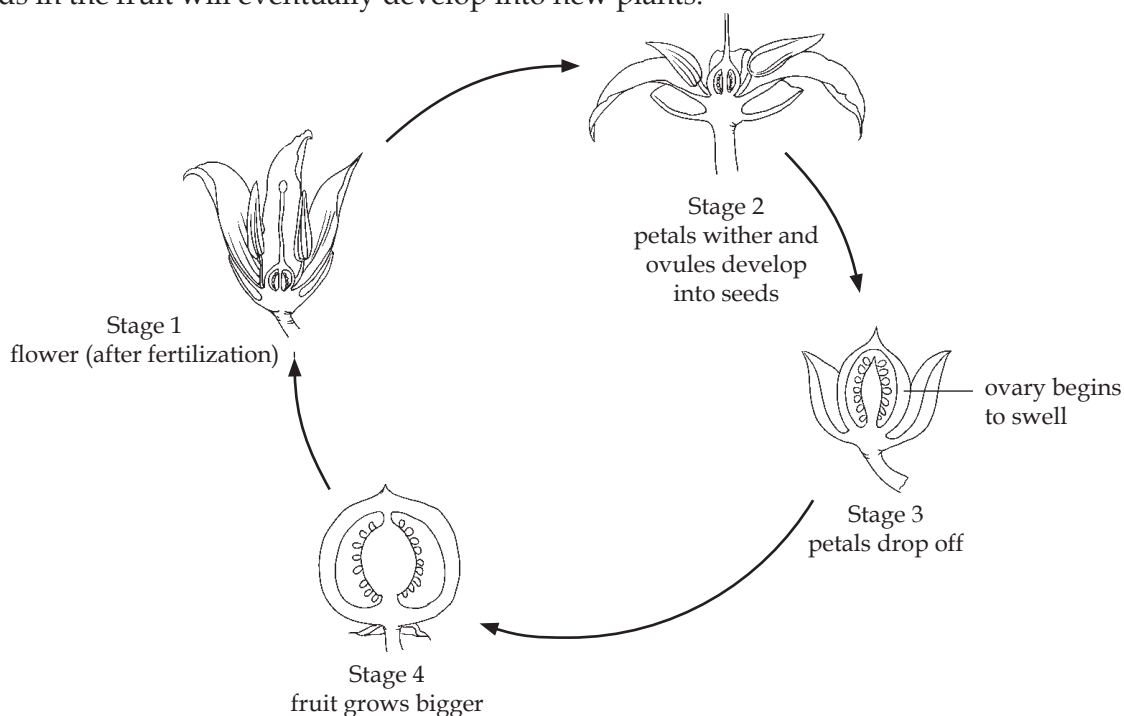
The fusion of the pollen grain with the female egg cell in the ovule is known as **fertilization**.

After fertilization, the ovary swells and develops into a fruit. The petals will wither and drop off.

## Reproduction In Plants

The ovules in the ovary develop and become the seeds.

The seeds in the fruit will eventually develop into new plants.



To produce new plants from seeds, both the male and female cells are needed. Therefore, **sexual reproduction** takes place in plants. In order for new plants to grow and develop well, the seeds have to be scattered away from the parent plant.

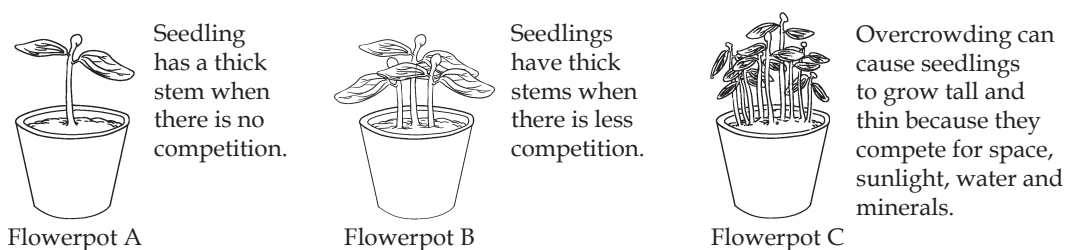
If seeds are not scattered, they will grow very close to the parent plant. This will lead to **overcrowding**. The new plants will not be able to grow well because they have to compete with one another for space, air, sunlight, minerals and even water.



### Experiment Let's find out what the effects of plant overcrowding are.

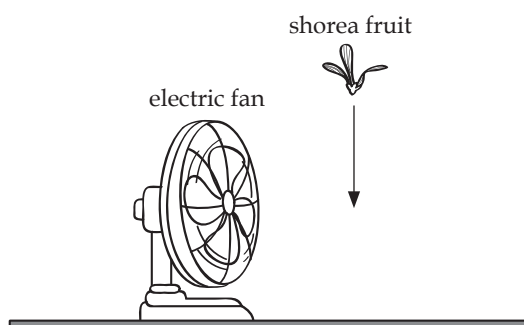
Three similar flowerpots are used to conduct the experiment. The number of seeds planted in each flowerpot is different.

For flowerpot A, one seed is placed in it. Flowerpot B has three seeds and flowerpot C has nine seedlings. All three pots are watered daily.



Overcrowding results to seedlings that have thin stems.

1. Benedict carries out an experiment to find out whether the length of the wingspan of the shorea fruit affects the time it takes to land on the ground when it is released in front of an electric fan as shown in the diagram below.

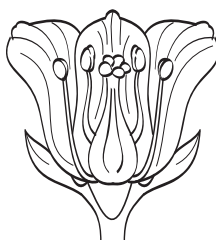


A. The distance between the electric fan and the shorea fruit  
B. The length of the wingspan of the shorea fruit  
C. The speed of the electric fan

- (1) A only  
(2) B only  
(3) A and C only  
(4) A, B and C

( )

2. The diagram below shows a cross-section of a flower.



- (1) The petals of the flower are huge.
- (2) The style that joins the stigma to the ovary is short.
- (3) All the reproductive organs are inside the flower.
- (4) Both the male and female parts are almost of the same length.

( )

3. Which of the following is classified **wrongly**?

	Form of dispersal	Fruit
(1)	wind	dandelion
(2)	water	rubber
(3)	splitting	kapok
(4)	animal	mango

( )

## Reproduction In Flowering Plants

4. Study the list of plants shown below.

coconut  
cassia  
pong pong  
rubber

Which of the following characteristics can be used to group the plants into two different groups?

- A. Poisonous and non-poisonous plants
- B. Land and water plants
- C. Dispersal by water and dispersal by explosive action
- D. Flowering and non-flowering plants

- (1) A and B only
- (2) A and C only
- (3) A, B and C only
- (4) A, B, C and D

( )

5. What is the function of Part A of the fruit shown below?



- (1) To trap air so as to allow the fruit to float on the water
- (2) To trap air so as to be dispersed by wind
- (3) To attract the animals to eat it
- (4) To hook onto the hair of the animals

( )