REPRODUCTION IN PLANTS

The production of new organisms from their parents is known as **reproduction**.

MODES OF REPRODUCTION IN PLANTS :

Different organisms reproduce in different ways. In plants, there are two different methods of reproduction -

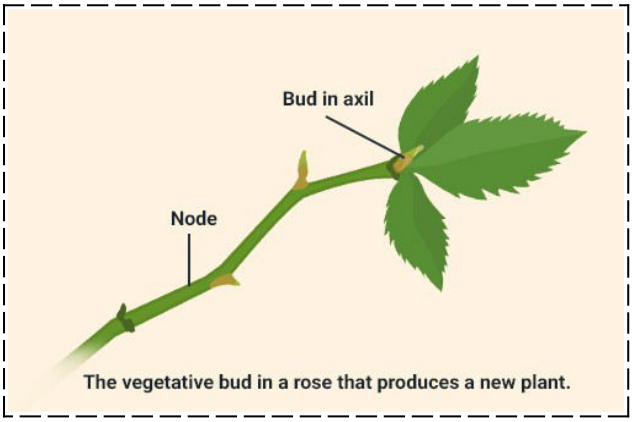
1. Asexual Reproduction

- ✗ The process in which **only one parent is involved** in the production of new individual of same kind is called asexual reproduction.
- ✗ In Asexual reproduction, **plants can give rise to new plants without seeds**.

Asexual reproduction in plants takes place by the following methods -

(a) Vegetative propagation

- It is a type of asexual reproduction in which **new plants are produced from roots, stem, leaves and buds**.
- The stem or branches of plant normally bear buds in the axil. The buds that are present in the axil of leaves develops into shoot. These are called **vegetative buds**.
- The vegetative bud give rise to new plant. These bud consist of short stem around which immature overlapping leaves are present. These can produce new plant by vegetative propagation.

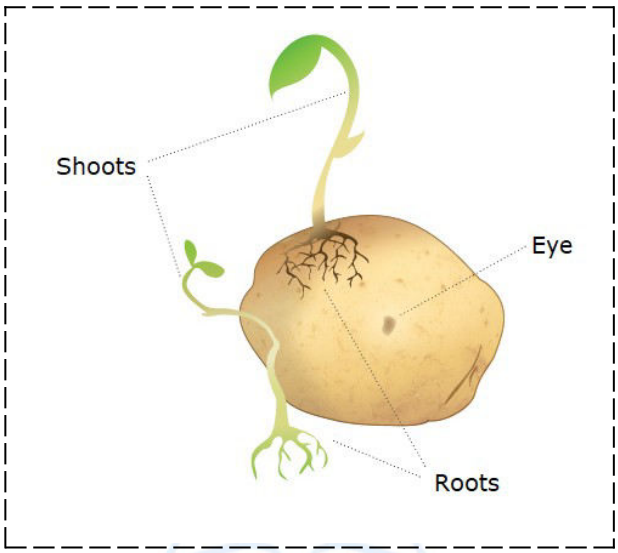


The vegetative bud in a rose that produces a new plant.

- Vegetative propagation may take place using various plant parts as given below-

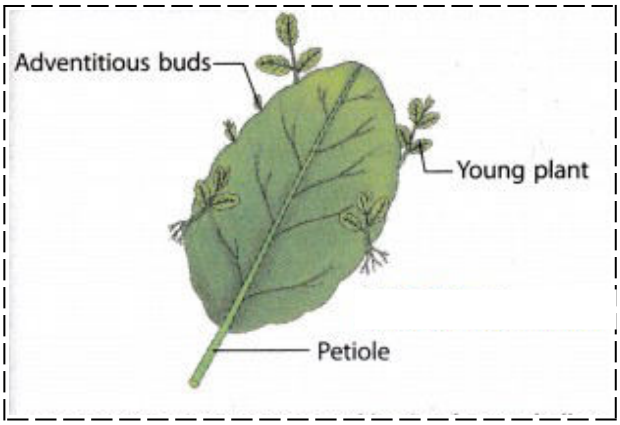
(i) Vegetative propagation by stem -

Many plants like **potato, sugarcane, rose and ginger** can be grown by stem cutting.
Potato has small buds called **eyes**. If potato is cut into small pieces with a bud or eye and buried in a moist soil, after some time potato bud grows into new plants.



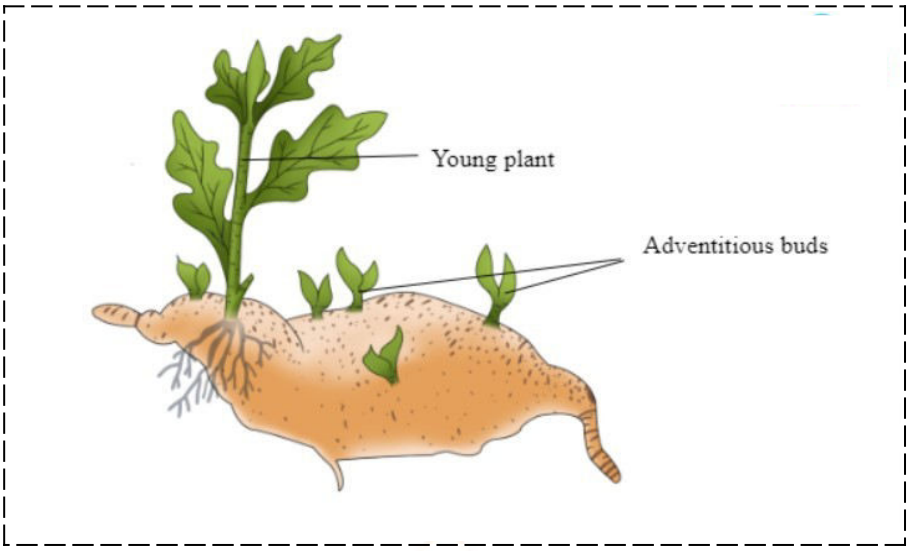
(ii) Vegetative propagation by leaves -

Some plants like ***Bryophyllum*** (sprout leaf plant) has buds in the margins of leaves.
If the leaves of these plants falls on moist soil, each bud can give rise to new' plant that resembles the parent plant.



(iii) Vegetative propagation by roots -

Some plants like **sweet potato and Dhalia** have adventitious buds on roots. Each bud can grow to produce new plant.



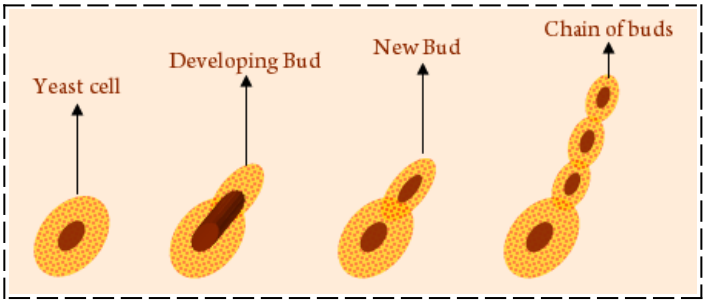
ADVANTAGES OF VEGETATIVE PROPAGATION

The plants produced by vegetative propagation has following advantages -

i. Plants produced vegetatively take less time to grow bear flowers and fruits earlier than those produced from seeds.
ii. The new plants are the exact copies of parent plant because they are produced from single parent.

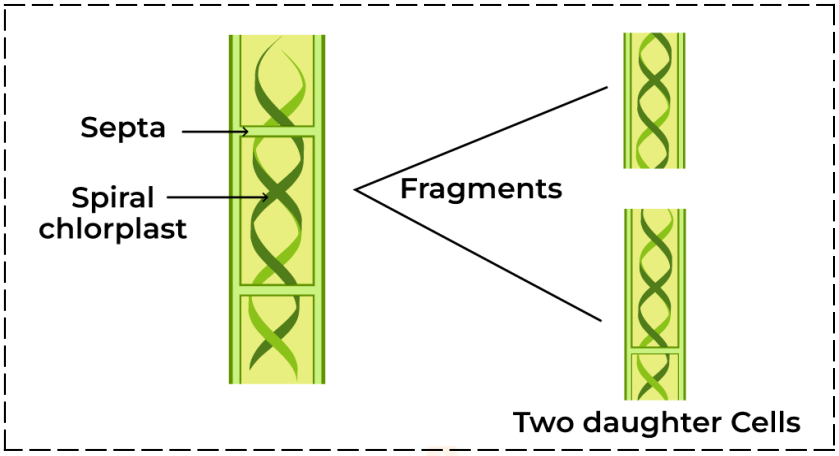
(b) Budding

- In this process, a small bulb-like projection called **bud** is formed on the parent body. The bud gradually grows in size and finally detaches itself from the parent plant.
- **Yeast** is a single-celled organism reproduced by the process of budding.
- Sometimes in yeast, another bud arises from the bud forming a chain of buds producing large number of yeast cells in short period of time.



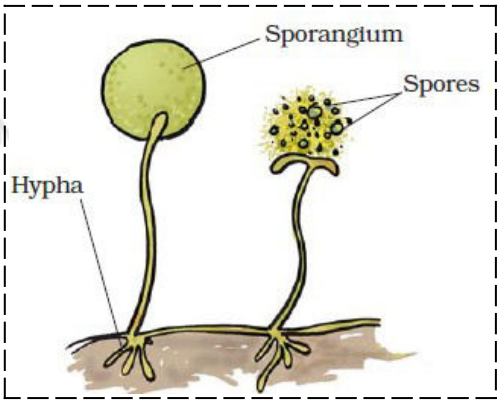
(c) Fragmentation

- In this method, the **body of parent breaks into small pieces** called fragments and each fragment grows into a new plant.
- Fragmentation of parent body **occurs when they are matured**, e.g. ***Spirogyra***, (algae), etc.

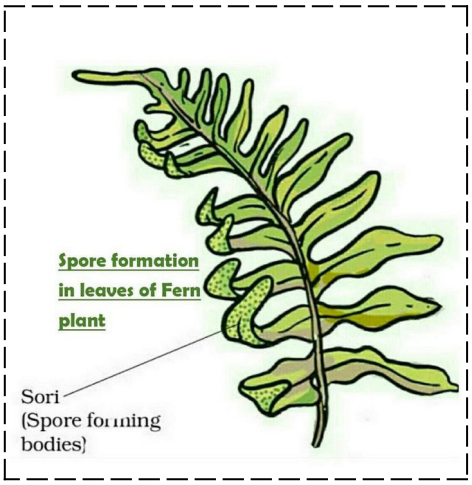


(d) Spore formation

- **Spores are very light** asexually reproducing bodies, which **can be carried over a long distance by air or wind**.
- Each spore is **covered by a hard protective coat** that protects them from unfavourable conditions such as high temperature and low humidity. So, they can survive for long time.
- When favourable conditions arrives the **spores burst and germinate to develop into new individuals**.



- Plants like mosses and **ferns** along with fungi like bread mound also reproduce by spore formation.

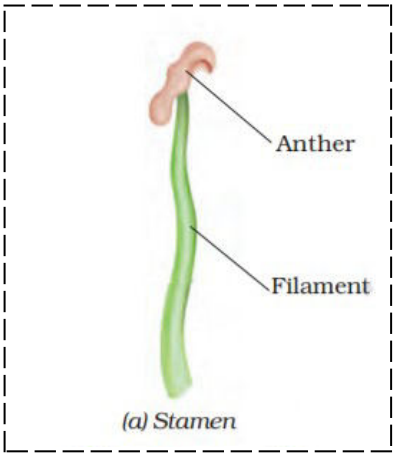


2. Sexual Reproduction

The method of reproduction **that involves the fusion of male and female gamete** is called sexual reproduction.

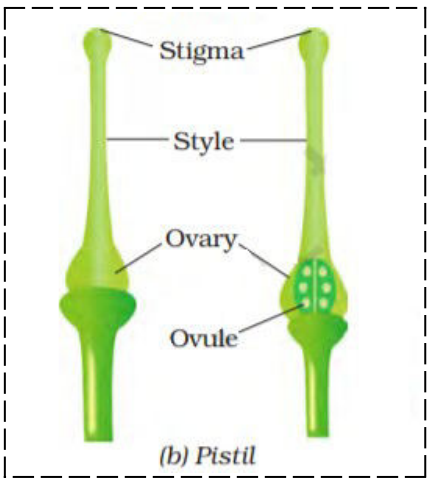
- ✗ **Flower is the reproductive part of plant**. Flower consists of sepal, petals, stamens and pistil.
- ✗ **Stamen and pistil are reproductive part** of the flower.

STAMEN – It is the **male reproductive part** of flower. It is made up of two parts, i.e. **filament and anther**. The **anther contains pollen grains**, which produce male gametes.



(a) Stamen

PISTIL – It is the **female reproductive part** of flower. It consist of **stigma, style and ovary**. The ovary contains one or more ovules. The **female gamete or egg is formed in ovule**.



(b) Pistil

- ✗ **In sexual reproduction a male and a female gamete fuse to form a zygote.**

Types of Flower

On the basis of type of reproductive organs present in a flower, the flowers are of following types -

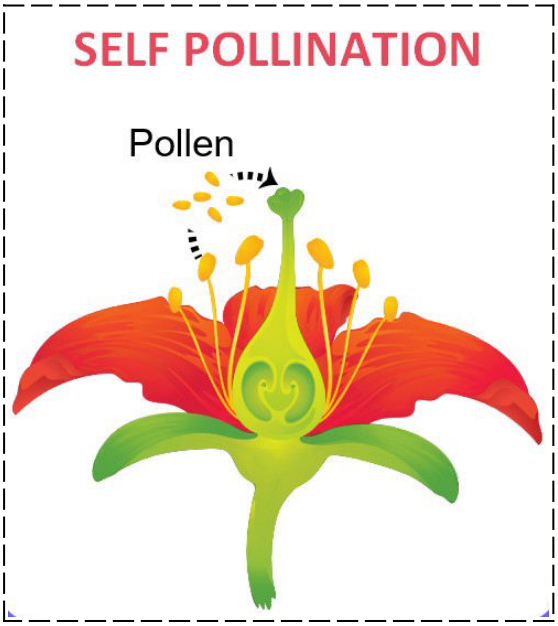
(i) Unisexual Flower – Flower that contain either only stamen or only pistil.
Example – Corn, papaya and cucumber.

(ii) Bisexual Flower – Flower that contain both stamen and pistil.
Example – Mustard, rose and petunia.

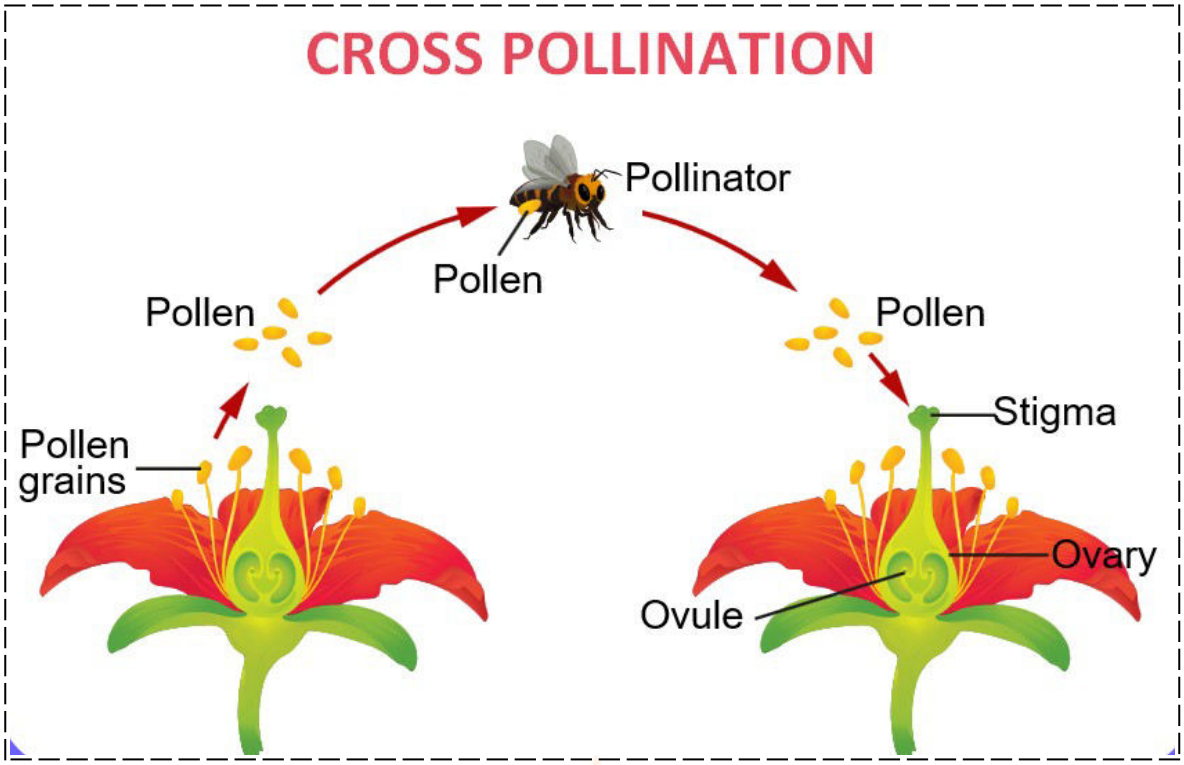
POLLINATION

The **transfer of pollen grains from the anther to the stigma** of a flower is called pollination. Pollination is done by wind, water, and insects. It takes place in two different ways -

(i) Self-Pollination – It generally occurs in a bisexual flower. When the pollen lands on the stigma of the same flower or another flower of the same plant.

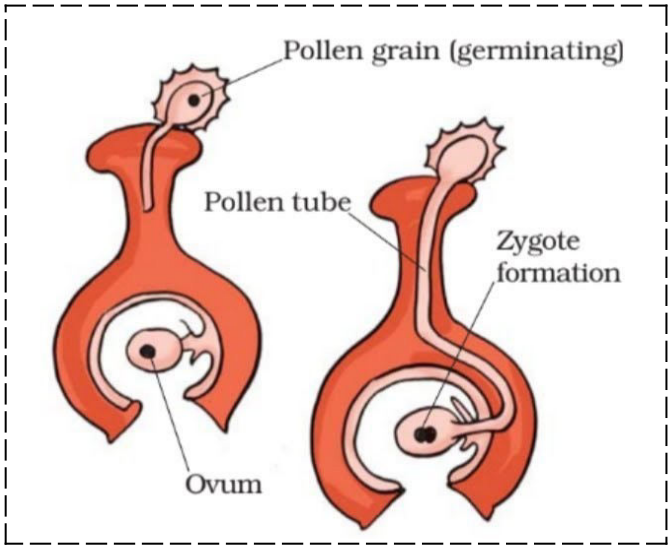


(ii) Cross-Pollination – It can occur both in unisexual and bisexual flowers. When the pollen of a flower lands on the stigma of a flower of a different plant of the same kind.



FERTILIZATION

The process of fusion of male and female gamete to form a **zygote** is called Fertilization. The zygote develops into an **embryo.** The embryo is that part of the seed which develop into a new plant.



FRUIT AND SEED FORMATION

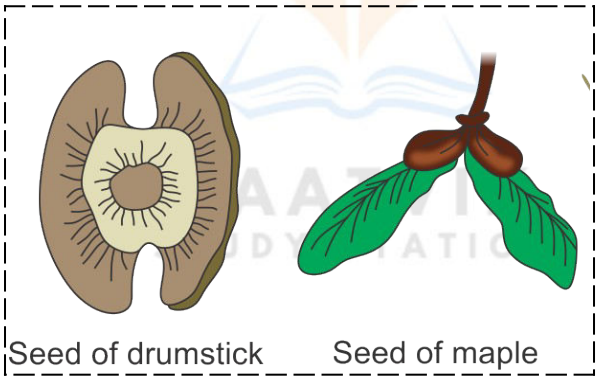
- ✗ After fertilization, the mature ovary of the flower develops to form fruit and other parts of the flower fall off.
- ✗ The ovule present in the ovary grows to become a seed.
- ✗ The seed contains an embryo enclosed in a protective seed coat and food for developing a new plant.

SEED DISPERSAL

Seeds and fruits of plants are carried away by the wind, water and animals. They are called **dispersal agents**.

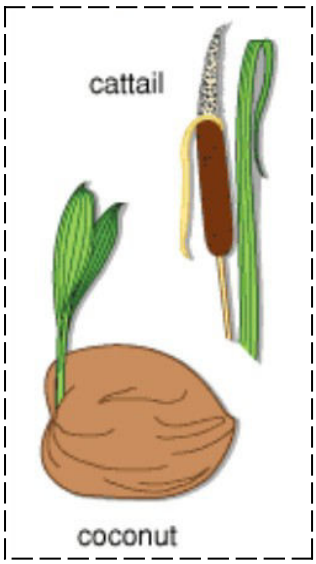
- **Dispersal by wind -**

  Seeds and fruits which are small in size and lightweight are dispersed by wind. They have hair or wings-like structure which help them to fly in the air.
  Example – Sunflower, drumstick and maple.



- **Dispersal by water -**

  Some seeds and fruits are dispersed by water. The seeds have the floating ability in the form of spongy or fibrous outer coats.
  Example – Coconut and Water lily.



- **Dispersal by Animals -**

  Some seeds develop hooks on their surface by which they get attached to the hairy bodies of animals and carried away to distant places.
  Example – Xanthium and Urena

- **Dispersal by explosion -**

  Some seed are dispersed by bursting of fruits with sudden jerks. In this, the seeds are scattered far away from the parent plant. This is called the explosive mechanism of seed dispersal.
  Example – Pea, caster and balsam.

GLOSSARY

- **Asexual reproduction** – Plants give rise to new plants without the formation of seed.
- **Budding** – A new organism develops from a bud of an existing organism.
- **Embryo** – The zygote develops into an embryo.
- **Fertilization** – It is the process of fusion of male and female gamete.
- **Fragmentation** – Organism breakdown into several fragments and each fragment develop into new individual.
- **Gamete** – A reproductive cell of an animal or plant.
- **Hypha** – A single filament in fungi.
- **Pollen grains** – It contains the male reproductive cell of a plant.
- **Pollen tube** – It is a hollow tube-like structure formed from pollen deposited on the stigma.
- **Pollination** – Transfer of pollen grains from anther to stigma of a flower.
- **Seed dispersal** – Scattering of seeds over a large area.
- **Sexual reproduction** – Formation of new plant through the fusion of male and female gamete.
- **Spore** – Small microscopic structure with thick wall to withstand unfavourable conditions.
- **Sporangium** – It contains spores and releases them on maturity.
- **Vegetative propagation** – Production of new plants from vegetative part of plants like stem, leaf and bud.
- **Zygote** – Formed as a result of fertilization.