The Flower

- Those plants that have flowers are called **flowering plants** while those that do not contain flower, seeds are called **non-flowering plants.**
- Parts of flower
  - Calyx, Corolla, Androecium and Gynoecium are the parts of a flower.
  - Sepals, petals, stamens, and pistil are their subparts.
  - Collection of sepals is known as calyx
  - Collection of petals is known as corolla.
  - Ovary contains one to numerous ovules.
  - Anther and filament are the parts of a stamen and collection of stamen is known as androecium
  - Stigma, style, and ovary are the parts of a pistil and collection of pistils are known as gynoecium.
- Types of flower
  - Bisexual flowers: Contain both male and female parts
  - Unisexual flowers: Contain either male or female part

Sexual Reproduction in Plants

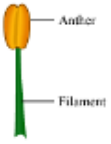
The flowers are the reproductive structures of a plant. The male reproductive part of a flower is known as the stamen, while the female reproductive part of a flower is known as the pistil.

Types of Flowers

Unisexual flowers-The flowers which contain only the male reproductive part, i.e stamen. For example, corn, cucumber

Bisexual flowers- The flowers which contain only the female reproductive part, i.e pistil. For example, mustard, rose

Structure of a stamen and pistil

Stamen	Pistil
	
The stamen consists of an anther and a filament. The anther contains pollen grains and produces the male gametes.	The pistil consists of the stigma, style, and ovary. An ovary contains ovules. The female gamete or egg is produced inside the ovule.

Pollination – It is the process of transfer of pollen from anther to stigma.

Self Pollination

- Pollens are transferred from stamen to pistil of the same flower of the same plant.
- It occurs within same flowers (bisexual).

Cross Pollination

- Pollens are transferred from stamen of one flower of a plant to stigma of another flower of same plant or that of a different plant of the same kind.
- It occurs in both unisexual and bisexual flowers.
- Pollens are transferred from one flower to another with the help of insects, birds, wind or water.

Fertilisation: It is the process of fusion of male and female gametes to produce a zygote.

After fertilisation, the ovary matures into the fruit and the ovule matures into the seed.

After Fertilization,

- Fertilized ovule forms seed.
- Floral parts such as sepals, petals, stamens, style, and stigma fall off.
- Ovary grows, enlarges, and ripens to become fruit.
- Fruits can be fleshy and juicy (examples – apples, mangoes) or dry and hard (example − nuts or peas).

Fruit – Fruit is the mature ovary.

- It has two main parts pericarp (It further contains outer hard epicarp, fleshy, edible mesocarp and innermost endocarp).
- Endocarp is the part that covers the seed.
- Fruit helps to protect the plant from animals or extreme climatic conditions.
- It also helps in seed dispersal and performs the function of storage of food.

Seed – Seed is the mature ovule.

- Outer covering of seed is called seed coat.
- A seed is made up of one or two cotyledons and a seed axis.
- Plumule of the axis develops into shoot and radicle into root.
- Under proper conditions seed germinates to form a new plant.

- **Seed Germination**
- It is the process of the seed develops into an individual plant utilizing the reserve nutrients present in the cotyledons.
- **Conditions necessary for germination**

  1. Water
  2. Oxygen
  3. Favourable temperature

- **Process of germination**

  1. The seed takes up water and swells.
  2. The embryonic radicle and plumule start growing and force the seed coat to rupture.
  3. The radicle comes out first and forms the root followed by the plumule which develops into the shoot.

- **Types of germination**

1. **Epigeal germination:** in this method the cotyledons are lifted above the ground and they act as the first leaves as a result of the rapid elongation of the hypocotyl. It takes place in seeds like Castor, cotton, sunflower etc.

2. **Hypogeal germination:** in this germination the cotyledons remain inside the soil and the epicotyls elongates and pushes the plumule above. It takes place in seeds like pea, maize, mango etc.

3. **Viviparous germination:** A special mode of germination in which seed starts germinating inside the fruit while it is still attached to the parent plant. Once germinated, the seedling is dropped into the soil where it fixes itself by developing roots. It takes place in mangrove plants, like *Rhizophora* and *Sonneratia.*