- Used in vegetative propagation

Modifications of stem

- **Underground stems** – For storage of food in potato, ginger, turmeric, etc. These structures also act as organs of perennation to help the plants survive in unfavourable conditions.
- **Tendrils** – Develop from axillary bud and are spirally coiled to help the plant to climb (E.g. Present in gourds and in grapevines)
- **Thorns** – Pointed, straight, and woody modifications of axillary buds, which arise to provide protection to plant from grazing animals. They are present in *Citrus, Bougainvillea.*
- **Photosynthetic stems** – Modification of stems into flattened or fleshy structures shown by some plants of arid regions to carry out photosynthesis (shown by *Opuntia and Euphorbia*)
- Underground stems of strawberry and grass spread to new niche to give rise to new plants when older ones die.
- In banana, pineapple, and *Chrysanthemum*, lateral branches originate from basal underground portion of main stem. They grow horizontally below the soil and then come out giving rise to leafy shoots.

The Leaf

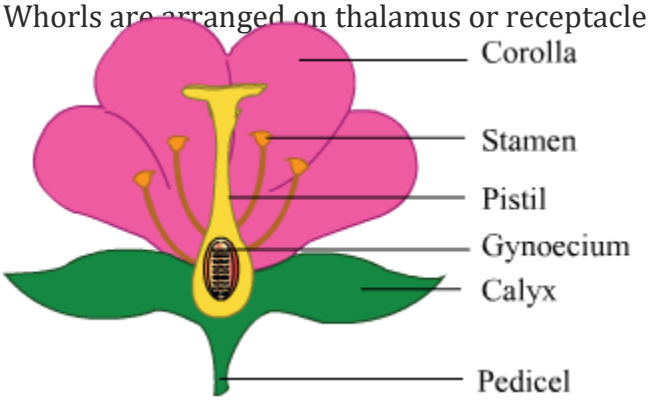
- The leaf is a lateral, flattened photosynthetic structure originating from the shoot apical meristems.
- It bears a bud in its axil and axillary bud develops into branches later.
- Leaves are arranged in an acropetal order.
- Important for photosynthesis

Parts of a leaf

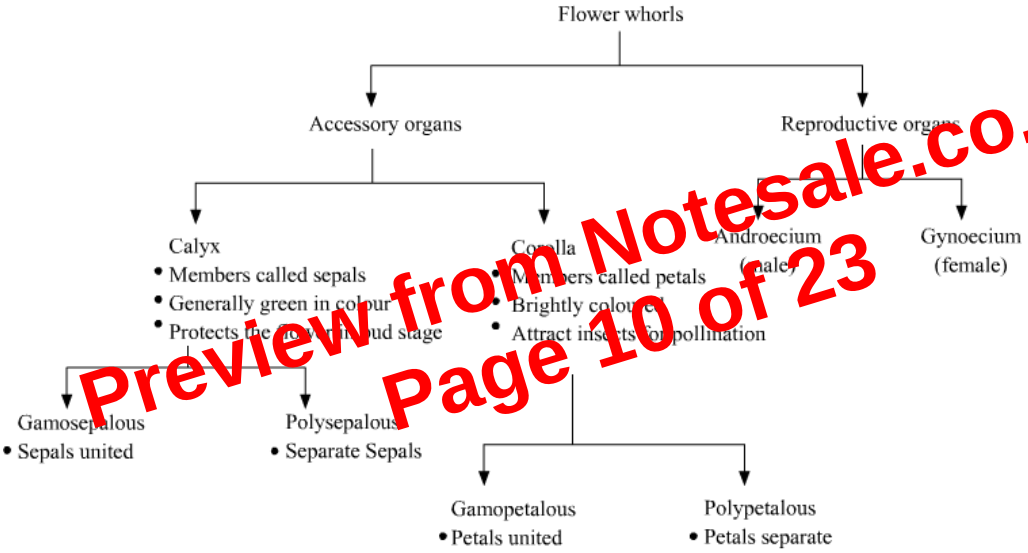
A typical leaf consists of:

- **Leaf base**
- It attaches the leaf with the base of stem.
- Bears two stipules (lateral, small leaf-like structure)

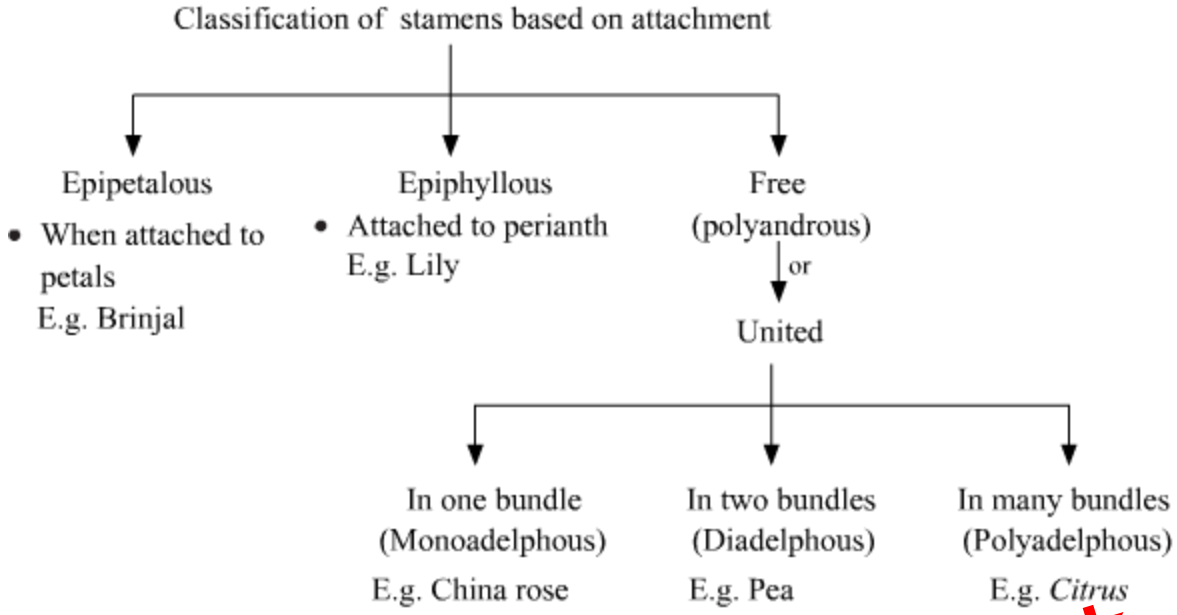
- Whorls are arranged on thalamus or receptacle (swollen ends of pedicel).



- A typical flower has 4 whorls.



- Sterile stamen is called a staminode.



Gynoecium

- Female reproductive part made up of carpels
- Carpel is made up of:
- Style – connects stigma to the ovary
- Stigma – receptacle for pollen grains
- Ovary – enlarged basal part on which style lies
- Each ovary bears one or more ovules attached to cushion-like placenta.
- After fertilization, ovules develop into seeds and ovary into fruit.

Placentation