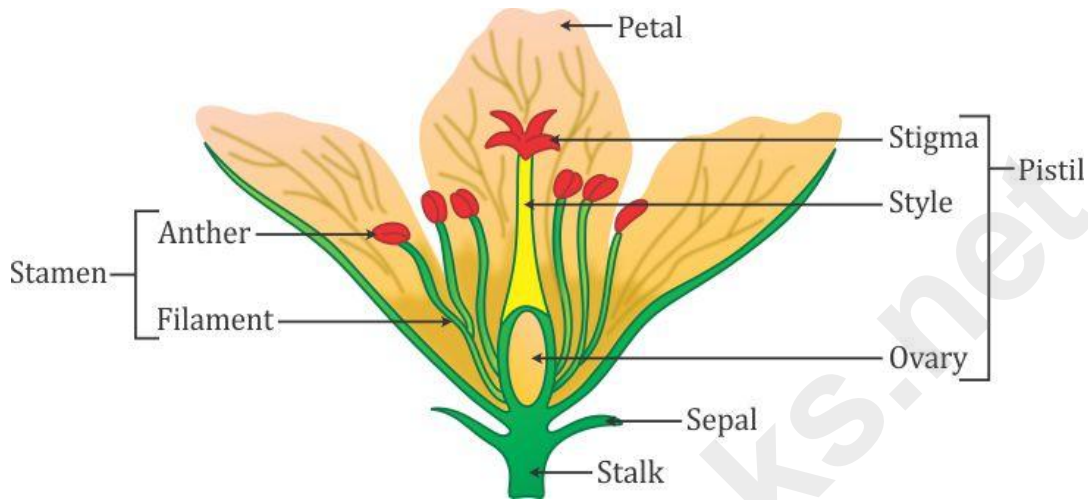


The Flower

- A **flower** is a specialised shoot in which the leaves are modified to form floral structures.



- A flower which has all the four whorls, calyx, corolla, androecium and gynoecium, is called a **complete flower**. Examples: *Hibiscus*, rose, sunflower etc.
- A flower in which one or more sets of floral whorls are absent is called an **incomplete flower**. Examples: Rue anemone, american elm, black walnut etc.
- The **essential whorls** of a flower are the whorls that are directly associated with the process of reproduction. Examples: Stamen and carpel.
- The **non-essential whorls** of a flower are the helping parts which either protect the reproductive parts of the flower or make them attractive for pollination. Examples: Calyx and corolla.
- In plants, such as wheat and grasses, the petals and sepals are undifferentiated and together compose the **perianth**.
- In some plants, the sepals are not green but appear brightly coloured like the petals. These sepals are called **petaloid sepals**, and the perianth is called a **petaloid perianth**. Example: Orchid etc.
- In some plants, the petals appear green in colour and are called **sepaloid petals**. The perianth is called a **sepaloid perianth**. Examples: *Viscum*, *Mistletoe* etc.
- **Bracts** are modified leaves arising from the axil of a small leaf-like structure. They may be green coloured like the leaves or different coloured like the petals. Examples: *Hibiscus*, *Bougainvillea* etc.
- The nectar in the flowers is secreted by a group of cells, present either at the base of the pistil or on the petals. These groups of cells are called **nectaries**. Example: *Nasturtium* etc.
- A flower that contains both male and female reproductive structures is called a **bisexual flower**. Example: *Hibiscus* etc.
- A flower that has only one reproductive structure, either the male or female, is called a **unisexual flower**. Examples: Papaya, palm etc.

- A unisexual flower which contains only the androecium is called a male or **staminate flower**. Example: Eastern cottonwood etc.
- A unisexual flower which contains only the gynoecium is called a female or **pistillate flower**. Example: Date palm etc.
- A flower in which both male and female reproductive organs are absent is called a **neuter flower**. Example: Ray florets of sunflower etc.
- If the male and female flowers grow on the same plant, then the plant is said to be a **monoecious plant**. Examples: Pumpkin, maize, cucumber etc.
- If the male and female flowers grow on separate plants, then the plant is said to be a **dioecious plant**. Examples: Palm, papaya etc.
- The **calyx** is the outermost whorl of a flower. It is made of small, green leaf-like structures called **sepals**.
- The **sepals** completely cover the flower at the bud stage and provide protection to the inner whorls of the flower. The sepals, if green in colour, perform photosynthesis, thereby contributing to the production of food in the plant. The non-green sepals sometimes perform the function of attracting pollinators.
- If sepals are joint or fused together, then the calyx is said to be **gamosepalous**. Example: *Hibiscus* etc.
- If sepals are free and not joined together, then the calyx is said to be **polysepalous**. Examples: Rose, mustard etc.
- In *Hibiscus*, the bracts form a whorl called **epicalyx**, just below the calyx.
- The **corolla** is the second whorl from the outside of a flower. It consists of units called **petals**.
- If the petals of a flower are fused or united, forming a tube-like structure, then they are called **gamopetalous**. Examples: *Nerium*, *Ipomea* etc.
- If the petals of a flower are not fused and are free from each other, then they are called **polypetalous**. Examples: Rose, mustard etc.
- Petals are generally arranged in a single whorl, but in some plants, they are arranged in double whorls. Example: Poppy etc.
- In some plants, the petals are spirally arranged. Example: Water lily etc.
- In some flowers, the number of petals is equal to the number of sepals. Example: Buttercup flower etc.
- In some flowers, the number of petals is not equal to the number of sepals. Example: Rose etc.
- The corolla of a flower performs two main functions—pollination and protection.
- The **androecium** is the third whorl from the outside and represents the male reproductive part of the flower. **Stamens** together constitute the androecium.

- When the stamens of a flower are free, the condition is called **polyandrous**. Example: *Petunia* etc.
- When the stamens of a flower are fused, the condition is called **adelphous**. Example: *Hibiscus* etc.
- When the filaments of the anthers in a flower are fused into one group, the condition is called **monadelphous**. Example: *Hibiscus* etc.
- When the filaments of the anthers in a flower are fused into two groups, the condition is called **diadelphous**. Example: Pea etc.
- When the filaments of the anthers in a flower are fused into more than two groups, the condition is called **polyadelphous**. Example: *Bombax* etc.
- The **gynoecium** or pistil is the female reproductive part of the plant. The pistil is made of units called **carpels**. The pistil consists of either a single carpel or many carpels.
- If the carpels of a flower are free, then the gynoecium is said to be **apocarpous**. Example: Buttercup flower etc.
- If the carpels of a flower are fused, then the gynoecium is said to be **syncarpous**. Example: Orchid etc.
- A **bicarpellary ovary** has two carpels.
- A **tricarpellary ovary** has three carpels.
- A **superior ovary** is an ovary attached to the receptacle above the attachment of other floral parts such as the thalamus and the calyx. Example: Onion etc.
- An **inferior ovary** lies below the attachment of other floral parts such as the thalamus and the calyx. Example: Rose etc.
- An **inflorescence** is a cluster or a group of flowers arranged on the plant stem.
- The arrangement of ovules inside the ovary is called **placentation**.
- In flowers showing **marginal placentation**, the ovary is monocarpellary and single chambered. The placenta, along with the ovules, develops along the margins of the carpel. Example: Pea etc.
- In flowers showing **axile placentation**, the ovary is two chambered or many chambered, in which the margins of the carpels fuse together. The fused margin grows inwards to meet in the centre of the ovary, forming a central axis. The placenta, along with the ovules, develops from this axis. Examples: China rose, lemon, orange etc.
- In flowers with **parietal placentation**, the ovules are attached to the walls of a unilocular ovary. The ovules are borne on the inner surface of the ovary wall. Examples: Mustard, *Argemone* etc.