



## CMG GardenNotes #135

# Plant Structures: Flowers

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Flowers are the reproductive structures of a flowering plant. Flowers are the primary structures used in identifying plant families.

## Function

Reproduction.

Horticultural uses:

- Aesthetic qualities.
- Cut flowers and potted blooming plants.
- Edible flowers and herbs.
- Plant identification.

## Structure

**Pistil** – Collective term for female floral parts. [Figure 1]

**Stigma** – Receives pollen, typically flattened and sticky.

**Style** – Connective tissues between stigma and ovary, elevates stigma to be within reach of pollination.

**Ovary** – Contains and protects developing ovules which are underutilized, immature seeds. Ovarian tissue develops into fruits. Ovaries can be separated into *carpels*, divisions, or sections that each contain ovules. Ovaries can be superior (attached to the receptacle above the point where other floral parts are attached), or inferior (attached to the receptacle below the point where other floral parts are attached).

**Stamen** – Male floral organ. [Figure 1]

**Anther** – Pollen-producing organ.

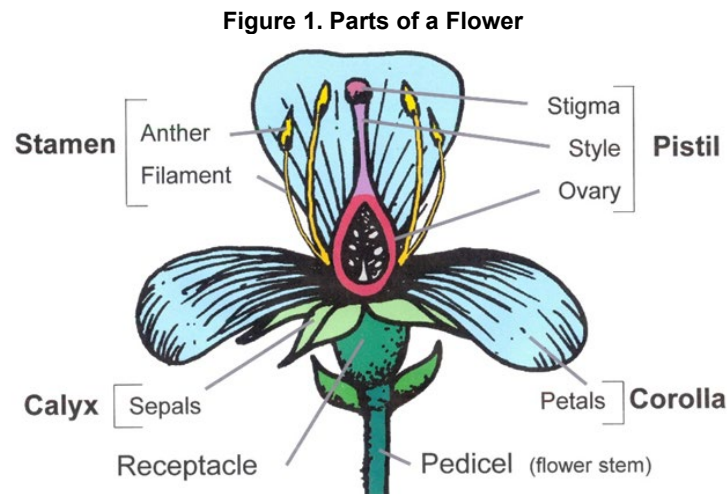
**Filament** – Stalk supporting anther.

**Petals** – Usually colorful display organs of the flower, collectively called the **corolla**. [Figure 1]

**Sepals** – Protective leaf-like enclosures for the flower buds, usually green, collectively called **calyx**. Sometimes highly colored like the petal as in iris. [Figure 1]

**Receptacle** – Base of the flower where the parts of the flower are attached. [Figure 1]

**Pedicel** – Flower stalk of an individual flower in an inflorescence. [Figure 1]



## Terms Defining Flower Types

**Complete** – Flower containing sepals, petals, stamens, and pistil.

**Incomplete** – Flower lacking sepals, petals, stamens, and/or pistils.

**Perfect** – Flowers containing male and female parts.

**Imperfect** – Flowers that lack either male or female parts.

**Pistillate (Gynoeceous)** – Flowers containing only female parts.

**Staminate (Androeceous)** – Flowers containing only male parts.

**Radially Symmetrical** – Able to be cut into a mirror image along many axes (e.g., daisy, lily, rose).

**Zygomorphically Symmetrical** – Flowers symmetrical along a single plane only; divisible into a mirror image in only one way (e.g., orchids, penstemon, snapdragon).

## Terms Defining Plant Types

**Monoecious** – (from the Greek for “one house”) Plants with separate male flowers and female flowers on the same plant.

**Dioecious** – (from the Greek for “two houses”) Plants with male flowers and female flowers on separate plants, functionally resulting in “male” and “female” plants.

## Inflorescence (Flower Arrangement on a Stem)

**Catkin** – A unisexual inflorescence, with flowers arranged along a central stalk; forming a roughly cylindrical and generally dangling structure which falls off in a single piece (e.g., willow, birch, alder, ash).

**Composite or Head** – A daisy-type “flower” composed of several ray florets (usually sterile with an attractive colored petal) around the edge and fertile disc florets in the center of the flat head (e.g., sunflower and aster). Some inflorescences may be composed entirely of ray florets, entirely of disc florets, or of various combinations of the two (e.g., chrysanthemum, rudbeckia, dandelion).

[Figure 2]

**Corymb** – A modified raceme, with flowers attached by stemlets (pedicels) arranged along the main stem proportionally so that outer, older flowers are level with inner, giving the display a flat top (e.g., yarrow, crabapple). [Figure 2]

**Cyme** – Clustered inflorescence with the single flower along the central stem opening first and bloom continuing in branches outwards, with subsequent flowers borne at the tips of lateral branches. May be flat-topped or helicoid (e.g., elderberry, borage). [Figure 2]

**Panicle** – An indeterminate inflorescence with repeated loose branching, creating “airy” clusters of flowers (e.g., oats, panicum grass, pagoda tree, begonia). [Figure 2]

**Raceme** – A loose spike, with flowers attached to a single main stem (peduncle) by stemlets (pedicels) of roughly equal length and with the terminal flower blooming last (e.g., snapdragon, lupine). [Figure 2]

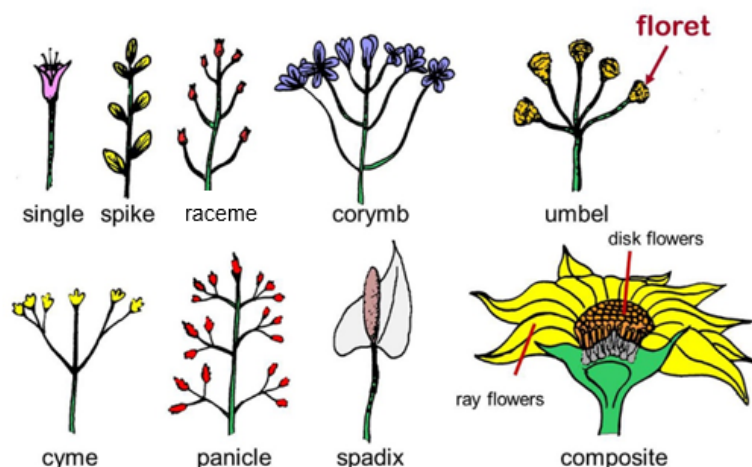
**Solitary or Single** – One flower per stem (e.g., tulip, crocus). [Figure 2]

**Spadix** – A thick, fleshy spike, often surrounded by a *spathe* (ornamental bract) (e.g., calla, caladium). [Figure 2]

**Spike** – Flowers attached quite closely to main stem, without or with very short stemlets, with bottom florets opening first (e.g., gladiolus, ajuga, and gayfeather). [Figure 2]

**Umbel** – Flowers attached to main stem at one central point, forming a flat or rounded top. Outer flowers open first (e.g., dill, Queen Anne’s lace). [Figure 2]

Figure 2. Inflorescences



## Pollination and Nectar Guides

To produce fruit and seed and ensure their survival, plants need to be pollinated. Some flowers are wind pollinated (anemophilous), but most are not. They must attract an animal to assist with the process of moving pollen from the anthers to the stigma. Nectar, an energy rich fluid produced by flowers, along with protein rich pollen, is the prize.

When pollinators collect nectar, the hairs on their bodies brush against the pollen and hold it tightly. As the pollinator moves to other flowers of the same species, the pollen can brush off onto the stigma and thus, pollination occurs.

To help bees and other pollinators find their way to their nectar, many plants have “nectar guides” on their flower petals.

These may or may not be visible to humans. Often, they are not, as many are only visible in the ultraviolet range. Fortunately, most insect pollinators can see in this light range and quickly find their way to the nectar. It is an example of mutualism, which ensures efficient pollination for the plant and fast nectar and pollen collection for the insects.



Figure 3. Nectar guides on penstemon (lines on the flower).

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Authors: David Whiting, CSU Extension, retired; Michael Roll, former CSU Extension employee; and Larry Vickerman, former CSU Extension employee. Artwork by Scott Johnson and David Whiting. Used with permission. Revised June 2016 by Patti O'Neal, CSU Extension, retired; Roberta Tolan, CSU Extension, retired; and Mary Small, CSU Extension, retired. Reviewed March 2023 by John Murgel, CSU Extension and Sherie Shaffer, CSU Extension.

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