

## Botany Language Basics for Identification of Flowering Plants

To understand the form, function, habitat and essential needs of plants use all your senses (vision, hearing, smell, taste, and touch) to observe plants. A collective understanding of fundamental botanical terms helps us share and discuss our discoveries with each other.

### Duration of vegetative parts

**Annual:** completes life cycle in one year

**Biennial:** completes life cycle in two years

**Perennial:** life cycle extends three or more years

**Deciduous:** plants that shed their leaves at the end of the season and become dormant

**Evergreen:** plants that are never without leaves attached (**broadleaf evergreens** include all evergreens except conifers which have needle or scale-like leaves)

### Plant appearance or habit

**Herbs (Herbaceous plant):** plants with non-woody stems

**Shrub: woody** perennial with more than one main stem

**Tree: woody** perennial with a single main stem

**Vine:** herbaceous plants with elongate, flexible, non-self-supporting stems

**Liana:** a woody vine

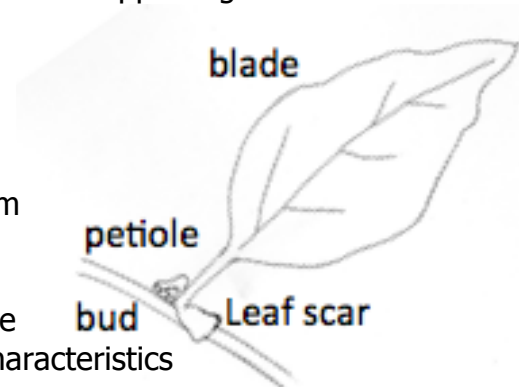
### Leaf features

**Blade:** Flattened part of the leaf

**Petiole:** stalk supporting the blade

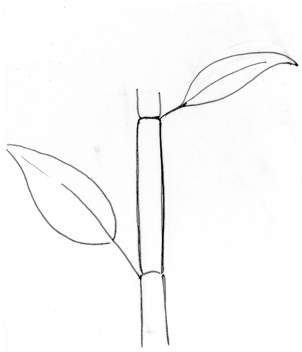
**Leaf scar:** a heart-shaped scar remains on the stem where the petiole was attached

**Bud:** forms above leaf scar and contain the beginnings of future growth; size, color, shape and marking of the scales on buds offer ID characteristics



### Leaf arrangements on plant stem

**Node:** area on stem from which one or more leaves develop



**Alternate** leaves  
1 per node



**Opposite** leaves  
2 per node



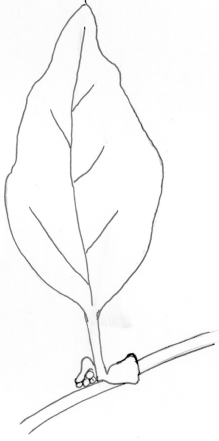
**Whorled** leaves  
More than 2 per node



**Rosette** leaves  
Radiating cluster at base

## Arrangement on leaf petiole

### Simple



**Simple** leaf is undivided though can be deeply lobed

### Compound



**Pinnate compound leaf** is feather-like with leaflets attached both sides of central axis



**Palmate compound leaf** is hand-like with three or more leaflets radiating from one point

**Look for a leaf scar and bud in area where the petiole was attached. No leaf scar or bud?**

**Leaflet:** resembles a leaf but is attaches to the axis of a compound leaf not the stem

## Leaf modifications

**Bract:** modified leaf often associated with a flower or inflorescence

**Sheath:** basal portion of leaf that surrounds the stem

**Spine:** sharp pointed leaf or portion of a leaf

**Tendrils:** twining leaf or portion of a leaf

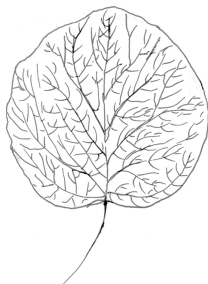
## Leaf blade surface

**Glabrous:** without hairs

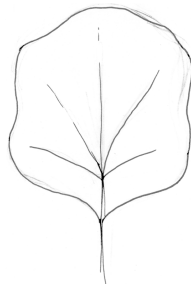
**Glaucous:** waxy coating

**Pubescent:** hairy surface--there are many kinds of hairiness

## Leaf blade venation



**Net (Reticulate)** veins form a complex network



**Palmate** veins radiate from a central point at base

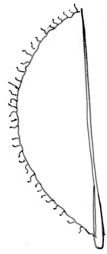


**Parallel** veins extend in same direction beside each other



**Pinnate** veins form a major mid-vein with branching side veins

### Leaf blade margin



**Ciliate**  
Fine hairs



**Crenate**  
Rounded teeth



**Entire**  
Smooth



**Lobate**  
Indented/lobed



**Undulate**  
Widely wavy



**Dentate**  
Symmetrical  
angular teeth



**Denticulate**  
Fine teeth  
angular teeth



**Serrate**  
Coarse teeth  
curved forward



**Serrulate**  
Fine teeth  
curved forward



**Sinuate**  
Wave-like  
indentations

### Leaf blade shape



**Cuneate**  
Wedge  
shaped



**Elliptical**  
Oval-shaped  
with small or  
no tapering



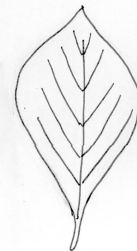
**Lanceolate**  
Pointed at  
both ends;  
base widest



**Oblanceolate**  
Widest section  
towards tip



**Spatulate**  
Spoon  
shaped



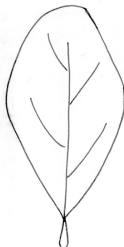
**Rhomboid**  
Diamond  
shaped



**Linear**  
Thin; sides  
parallel



**Oblong**  
Wider;  
parallel sides



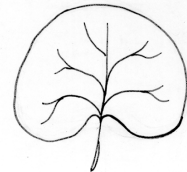
**Obovate**  
Egg shape;  
widest at tip



**Ovate**  
Egg shape;  
widest at base

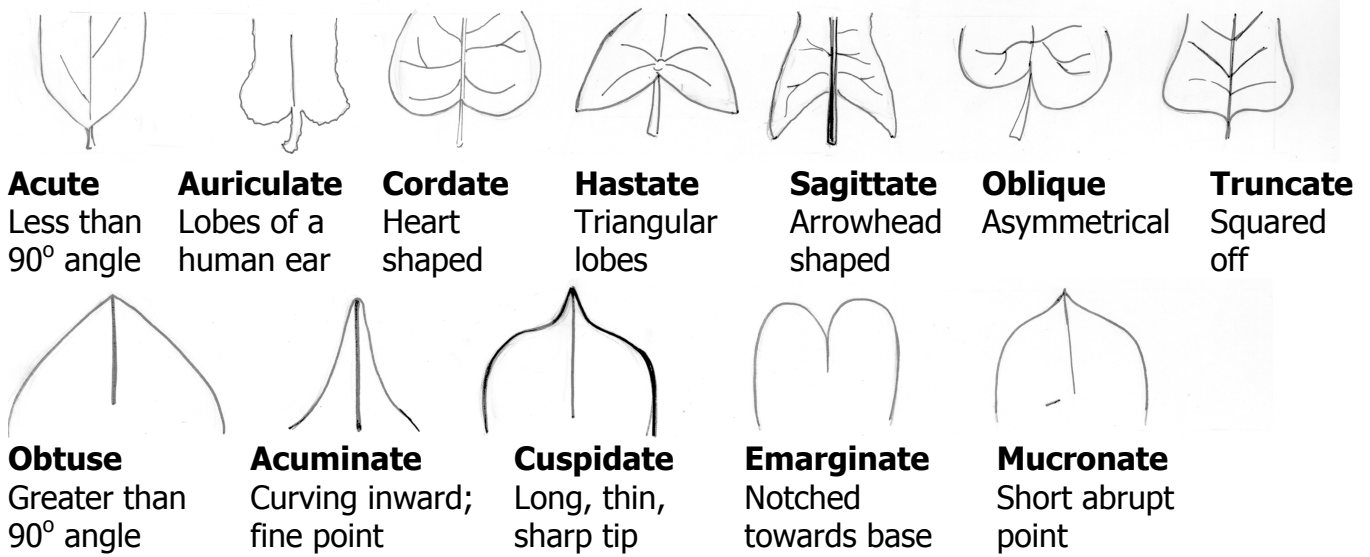


**Obcordate**  
Heart  
shaped

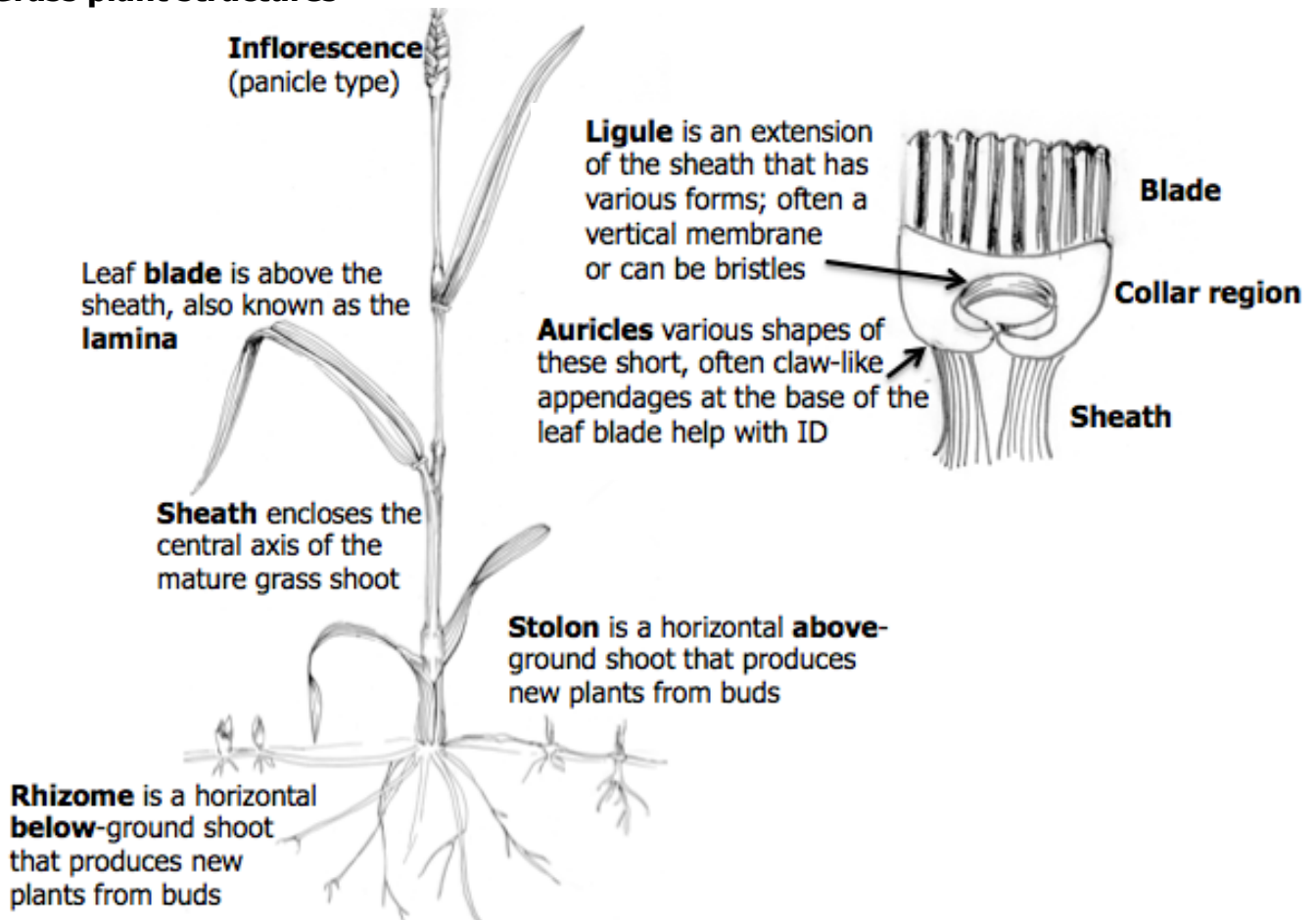


**Reniform**  
Kidney  
shaped

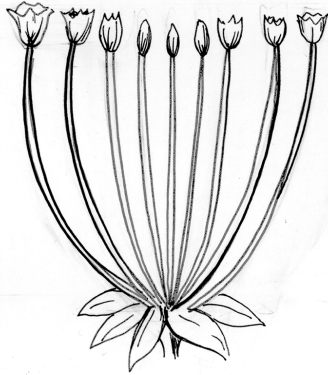
## Leaf blade bases and tips (apex)



## Grass plant structures



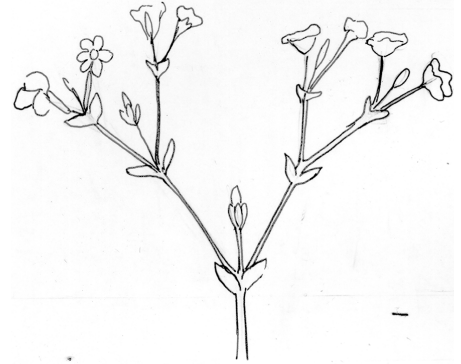
## Inflorescence type



**Umbel** flowers originating from a common point with floral stalks of equal length



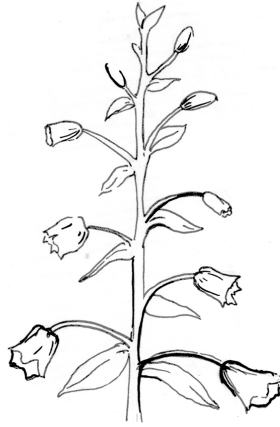
**Corymb** flowers along a central axis with floral stalks of unequal length, all ending at the same height



**Cyme** produce a flat-topped with oldest flowers at the end of main axis



**Spike** has flowers without stalks along a central axis



**Raceme** has flowers with short floral stalks along a central axis



**Panicle** is a branched or compound raceme



**Head** produce a short dense arrangement ray and disk flowers



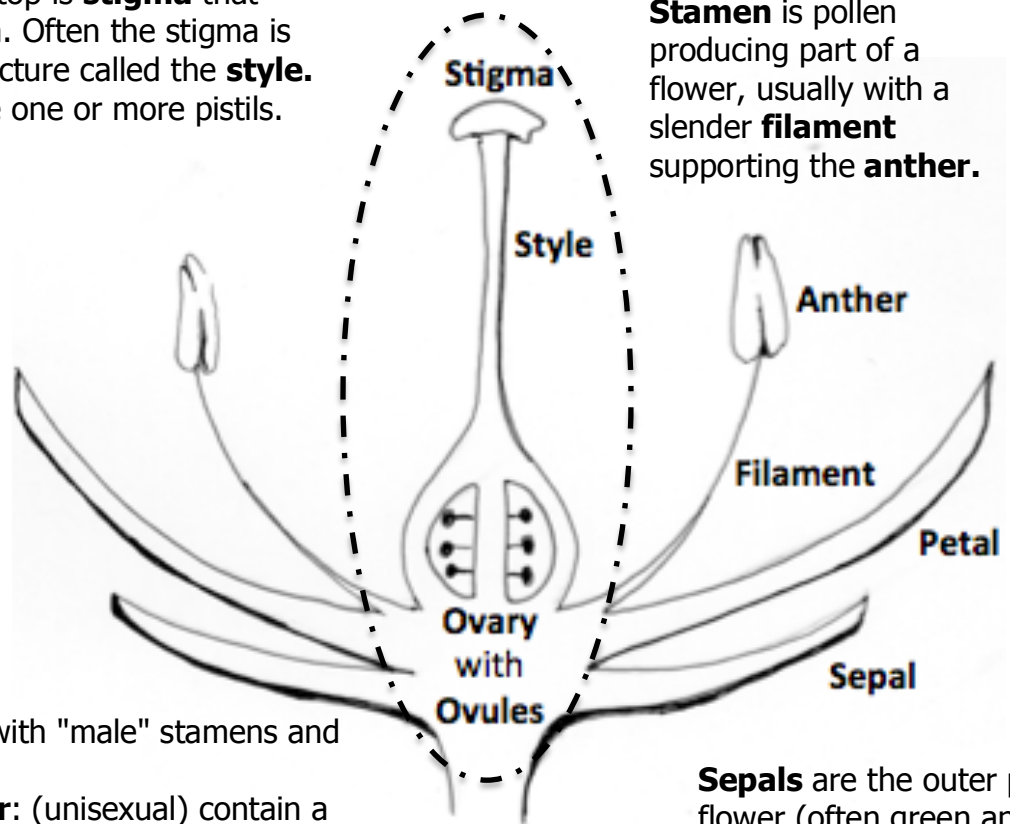
**Solitary** is a single flower on a flowering stalk attached to stem



**Catkin** is a spike-like; often pendent and falling as a unit

## Flower part

**Pistil** consists of the **ovary** at the base that contains the embryo seeds or **ovules**. At the top is **stigma** that receives the pollen. Often the stigma is on a stalk-like structure called the **style**. A flower may have one or more pistils.



**Stamen** is pollen producing part of a flower, usually with a slender **filament** supporting the **anther**.

**Perfect flower:** with "male" stamens and "female" pistil

**Imperfect flower:** (unisexual) contain a pistil or stamens, but not both

**Monoecious species:** with male on female flowers on same plant

**Dioecious species:** with male and female flowers on separate male and female plants

**Sepals** are the outer parts of the flower (often green and leaf-like) that enclose a developing bud.

**Petals** are parts of a flower that are often conspicuously colored.

**Regular flower** (actinomorphic): radially symmetrical; star-shaped

**Irregular flower** (zygomorphic): one dividing plane into two mirror-image halves

**Complete flower:** with all 4 main parts (sepal, petal, stamen and pistil)

**Incomplete flower:** lacking one or more of 4 main parts (sepal, petal, stamen, pistil)

Learn more: [gardening.cornell.edu/polycultures](http://gardening.cornell.edu/polycultures)

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